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DISSERTATION ABSTRACT

HABERMAS' COGNITIVE INTERESTS: TEACHER AND STUDENT INTERESTS
AND THEIR RELATIONSHIP IN AN ADULT EDUCATION SETTING

Stephen Lee Butler

Doctor of Education, December 15, 1997
(M.A.E., Chapman University, 1988)
(B.S.E., Florida Atlantic University, 1976)

193 Typed Pages

Directed by William B. Lauderdale

The cognitive interest theory of German philosopher Jürgen Habermas provided the theoretical foundation for this research. Habermas believes that all knowledge is constituted through one of three cognitive interests. Each of these three interests, the technical, practical, and emancipatory, implies specific ways of learning. A better understanding of these cognitive interests and how they affect learning could lead to more informed decisions concerning curriculum and instruction.

Three questions were addressed. Did students with the same cognitive interest as their teacher perform better than students with a different cognitive interest than their teacher? Were any of the three cognitive interests more effective for learners? Were any of the three cognitive interests more effective for teachers?

To determine the cognitive interest of each respondent in this study, the Cognitive Interest Inventory was developed by the researcher. Validity of the inventory was verified three ways. Content validity was verified by a jury of experts and a field test.

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Construct validity was confirmed by a Factor Analysis of all responses ($n = 551$) to the study. Concurrent validity was confirmed by comparing the inventory to an established instrument with proven validity and reliability.

Alpha coefficients ranging from .75 to .84 indicated high internal consistency of the three scales contained in the inventory. Split-half reliability of .82 indicated high internal consistency of the instrument as a whole. The instrument had sufficient validity and reliability for measuring the cognitive interests of students and teachers in this study.

The study took place during the first three courses (War and Conflict, War Theory, and Strategic Environment) of the United States Air Force's Air Command and Staff College (ACSC) during academic year 1997. Each United States Air Force student ($n = 319$) and each teacher ($n = 75$) who responded was placed into a cognitive interest category based on his/her responses to the instrument. Using these cognitive interest categories and the students grades on the final examinations for each of the three courses, three "t-tests" and six one way ANOVAs measured the significance of the relationships between cognitive interest and student performance for each course.

The mean grade of students with the same cognitive interest as their teacher was higher in all three courses, but the difference was only statistically significant in one course. There was no significant difference among the means based on the cognitive interest of the student. There was no significant difference among the means in two of the three courses based on the cognitive interest of the teacher. In one course, the mean grade of students of emancipatory teachers was significantly higher than the mean grade of students of practical teachers.

These results have implications for education at all levels as evidence that there are many ways to learn and teach effectively and that matching students and teachers by their cognitive interest may improve student performance.

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Stephen Lee Butler

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HABERMAS' COGNITIVE INTERESTS: TEACHER AND STUDENT INTERESTS
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Stephen Lee Butler

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the Graduate Faculty of
Auburn University
in Partial Fulfillment of the
Requirements for the
Degree of
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Auburn, Alabama

December 15, 1997

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I

INTRODUCTION

This research examined the relationship between the cognitive interests of teachers and learners in an adult education setting. The theoretical foundation was based on the ideas of Jürgen Habermas, first presented in a lecture at the University of Frankfurt, Germany, on June 28, 1965, and first published in English as *Knowledge and Interest* (Habermas, 1966). These ideas were greatly expanded in Knowledge and Human Interests (Habermas, 1971), and incorporated into educational theory through the works of Mezirow (1981), Grundy (1987), Young (1990), and others.

It was through the work of Grundy (1987) that this researcher was introduced to the theories of Habermas and became interested in his three cognitive interests. As she searched for solutions regarding the various approaches to curriculum theory, Grundy discovered that what she “needed was a theoretical ‘bedrock’ which would provide a coherent ‘foundation for the foundations’ I found this coherent theory in Habermas’ (1972) theory of knowledge-constitutive interests” (p. 2). What she found was “a theory about the fundamental human interests which influence how knowledge is ‘constituted’ or constructed” (p. 7). Throughout the study of others in the field of curriculum (e. g., Henderson & Hawthorne, 1995; Erickson, 1995; and Walker & Soltis, 1992), this researcher soon discovered that Habermas’ (1966, 1971) theory of cognitive interests consistently explained the way learning takes place in a wide variety of educational settings. As Grundy pointed out, “it is not surprising that we are able to identify instances of these interests in the realm of human interaction. . . . it is also not surprising

that instances of curricula informed by one or other of these interests are identifiable in the work of teachers” (p. 141).

In another widely used curriculum book, Schubert (1986) emphasized the importance of Habermas, “Jürgen Habermas is one of the most widely cited contemporary philosophers who deals with the theory of knowledge” (p. 180). He went on to describe Habermas’ theory as a “comprehensive theory of knowledge” (p. 181). Aber (1991) added when discussing Habermas: “Despite its breadth and complexity, this theory is worth focusing on” (p. 126).

Combined with this theoretical foundation provided by Habermas, this research explored the idea that everyone has his/her own cognitive interest. This is an area that this researcher felt must be investigated. Messick & Associates (1976) emphasized the importance of this concept:

Individuals differ. For close to a century now, psychologists have been studying the ways in which individuals differ in personal and intellectual characteristics and the importance of these differences in various social contexts. There is, perhaps, no more important focus for such research than the problems of education, particularly those of higher education. (p. 268)

This research used the three cognitive interests provided by Habermas’ (1966, 1971) theory, the technical interest, the practical interest, and the emancipatory interest.

“These interests constitute the three types of science by which knowledge is generated and organized in our society” (Grundy, 1987, p. 10). All learning falls into one of these three interests. According to Habermas (1971), “Orientation toward technical control, toward mutual understanding in the conduct of life, and toward emancipation from seemingly ‘natural’ constraint establish the specific viewpoints from which we can

apprehend reality as such in any way whatsoever” (p. 311). Further investigation of Habermas’ ideas on how knowledge is generated and the idea that each individual has his/her own cognitive interest was important for curriculum developers, teachers, and learners of all ages.

Bernstein (1985) provided a perspective as to how important these human interests are to every individual when he referred to cognitive interests using the following words: “These cognitive interests are not merely contingent or accidental. They are basic and unavoidable, rooted in what we are as human beings” (p. 13). Tinning (1992) added, “knowledge is *always* [italics added] constituted on the basis of the natural needs and *interests* [italics added] of humans that have been shaped by particular social and historical conditions” (p. 3).

Statement of the Problem

Beliefs about how people learn provide the foundation for many decisions made by curriculum developers, teachers, and learners. Jürgen Habermas has espoused a theory describing the three ways people learn. A better understanding of this theory and its implications in the classroom may enable everyone concerned with education to make more informed decisions about curriculum and instruction. The primary focus of this study was to investigate the relationship between matched and mismatched cognitive interests of students and teachers and performance in the classroom in an adult education setting. In addition, this research compared the performance of students from each of the three cognitive interest groups, disregarding the cognitive interest of the teacher. Finally, this research compared the performance of students whose teachers possessed each of the cognitive interests, ignoring the cognitive interest of the student. Within the context of three courses (War and Conflict, War Theory, and Strategic Environment), at the United States Air Force’s Air Command and Staff College (ACSC), this study was concerned with answering the following questions.

Research Questions

1. Did students with the same cognitive interest as their teacher perform better on the end of course written examination than students with a different cognitive interest than their teacher?
2. Did students with any of the three cognitive interests perform better on the end of course written examination than students with the other two cognitive interests, regardless of the cognitive interest of the teacher?
3. Did students of teachers with any of the three cognitive interests perform better on the end of course written examination than students of teachers with the other two cognitive interests, regardless of the cognitive interest of the student?

Hypotheses Tested

1. Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference between the mean grade of students who have the same cognitive interest as their teacher and the mean grade of students who have a different cognitive interest than their teacher on the end of course written examinations.
2. Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examinations. The cognitive interest of the teacher was ignored during testing of this hypothesis.
3. Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the students on the end of course written examinations based on the cognitive interest of their teacher. The cognitive interest of the student was ignored during testing of this hypothesis.

The independent variable for the first hypothesis was a categorical variable determined by comparing the cognitive interest of each student with the cognitive interest of his or her teacher. Based on this comparison, each student was labeled as either (1) having the same cognitive interest as the teacher, or (2) having a different cognitive interest than the teacher. To accomplish this, each student and teacher was placed into one of three groups based on their responses to a cognitive interest inventory developed by this researcher. This instrument categorized each student and each teacher as having the predominant cognitive interest of either technical, practical, or emancipatory. (The complete Cognitive Interest Inventory, including cover letter, can be found in Appendix A.) The dependent variable was the student's grade on the end of course written examination for each course.

The independent variable for the second hypothesis was the cognitive interest of the student, determined by his/her responses on the Cognitive Interest Inventory. Again, the dependent variable was the student's grade on the end of course written examination.

The independent variable for the third hypothesis was the cognitive interest of the teacher, determined by his/her responses on the Cognitive Interest Inventory. As in the previous hypotheses, the dependent variable was the student's grade on the end of course written examination.

Setting

This study took place at the United States Air Force's Air Command and Staff College, the service's intermediate service school. There were 601 students in the class of 1997, including 387 United States Air Force officers. (A complete description of the demographics of the class can be found in Appendix B.) For the purposes of this study, only the Air Force officers ($n = 387$) were investigated. By limiting the subjects to only Air Force officers, a more homogenous group was studied.

The research was also limited to the first three courses of the academic year, War and Conflict, War Theory, and Strategic Environment. At the conclusion of these three courses, each student had experienced the three teachers they had in their primary seminar group. Each student was asked to complete the researcher-developed inventory. This enabled the researcher to categorize each student as having a predominant cognitive interest of either technical, practical, or emancipatory. In addition, each of the classroom teachers of these three courses was given the same inventory and categorized into one of the same three cognitive interest groups. There were 31 teachers teaching the War and Conflict course, 30 teaching the War Theory course, and 31 teaching the Strategic Environment course.

Significance of this Research

This researcher believed this study was important for several reasons. First, a thorough review of the literature showed a noticeable lack of studies on cognitive interests. In addition, even though many cited his contributions, there is very little research investigating the theories of Habermas, particularly as it relates to education.

The second reason this research was important is the minimal amount of research on adult learners. Although Dunn, et al. (1995) concluded that "College and adult learners showed greater gains than elementary school learners or secondary school learners" (p. 358), the vast majority of studies on learning discovered by this researcher continue to focus on elementary and middle school age students.

The third reason this study was important is the originality of the concept. Though Mezirow (1981) used the work of Habermas as the foundation for developing an effective adult education program, this researcher found no evidence of any studies investigating Habermas' learning domains. As Mezirow said, "Three distinct but interrelated learning domains are suggested by Habermas' three primary cognitive interests . . . each domain suggests to me a different mode of personal learning and

different learning needs” (p. 4). This researcher believed it was important to study these domains in the context of the classroom and begin filling in the gaps in the research of adult learners.

Finally, the school where this study took place, ACSC, added to the significance of this research. Roth (1996) introduced this military institution to the ideas and research methods of professional educators. This study was an attempt to continue that process. In addition, the results of this study may enable the leadership of the school to make more informed decisions in the future about curriculum and instruction with some empirical data to support those decisions.

Limitations of the Study

As with any research, there were certain limitations of this study. First, and perhaps most importantly, there is a definite risk of restricted range if this sample is used to generalize to another population of adult learners. A cursory look at the demographics of this class shows that of the 387 Air Force officers, 348 (89.9%) have masters degrees, 8 (2.0%) have doctorate degrees, and 6 (1.5%) have professional degrees (doctors and lawyers). Though this may be an unbalanced sample, there were several reasons for using this group that are explained in detail in Chapter III, Methodology.

Another limitation of this study is one common to many adult education programs, the lack of educational preparation of the teachers. Galbraith (1990) points out, “In most cases the instructors in these programs are content experts who have little formal preparation in the process of instructing adult learners” (p. xiii.). Knox also suggests that “most instructors in adult education programs are expert in the content they teach, but they usually have little preparation in the process of helping adults learn” (cited in Galbraith, 1990). Although outstanding professionals from a wide variety of career fields, many ACSC teachers have had no experience in the classroom, and a very small percentage have studied education. Though this may have been a limitation in

some respects, Chapter III explains how this may, in fact, have been a positive factor for this particular study.

Finally, a major assumption of this research was that the cognitive interest of the teacher would affect the way he/she related to learners. Although this researcher found an abundance of evidence supporting this assumption, it remains theory-based. As Zinn (1983) observed: "Although there is some evidence in the literature linking beliefs and actions, the primary support for a positive correlation between them is theoretical rather than empirical" (p. 6). In the following chapter, this researcher reviewed the literature on Habermas, his theory of cognitive interests, and the importance of recognizing each learner as an individual.

II

LITERATURE REVIEW

“The basis of knowledge in interest affects the possibility of knowledge as such” (Habermas, 1971, p. 297).

This review of the literature begins with a look at Jürgen Habermas and his theories that impact education. It includes a brief look at some of the influences on the thinking of this modern German philosopher. A thorough description of his concept of knowledge-constitutive interests follows. The first phase of this review concludes with a look at his importance in the field of education. Even though he never addresses education directly, this researcher feels his influence is unavoidable. As Grundy (1987) explained:

His theoretical explorations into the nature of human knowledge and theory/practice relationships were not written within a context of educational theory, nor do they arise directly out of educational considerations. They do, however, have implications for educational theory and for understanding educational practices. (p. 8)

A brief note on sources is warranted at this point in the review. Even though this researcher understands the importance of primary sources and their value to any study, many of Habermas' ideas are best explained through the words of others. Translations of Habermas are used when possible, but many of the concepts are explained through the words of English speaking authors and educators. As one author explained:

“His writing is about as accessible to the average man (even the average honours graduate) as an engineering textbook written in Swahili” (Wilby, 1979, p. 669). Ewert (1991) provided another reason for reading Habermas through the words of others:

Habermas has not directly addressed education as a social practice. In the few instances in which Habermas directly mentions education, he mentions it as an example rather than as a main topic. For this reason, the significance of Habermas’s work for education is best viewed from the perspective of the educational literature that applies Habermas’s theories and concepts. (p. 346)

The second phase of this review investigates the second pillar of this research study, individual differences in adult learners. As Galbraith (1990) warned, “it is erroneous to speak of ‘*the* adult learner’ as if there is a generic adult that can represent all adults (p. 25). Adult learners are like learners of all ages in that they each have individual interests that determine how they learn. In addition, the impact of matching the cognitive interests of teachers and learners is discussed. Some researchers (e. g., Dunn, et al., 1989) believe very strongly that accommodating the interests of students results in an increase in achievement; while others (e. g., Cornett, 1983) advocate a mix of matching and intentional mismatching to broaden both the learning capacity of students and the teaching ability of teachers. One idea that appears certain, according to the literature, is the importance of teachers and students understanding their own interests and recognizing that different interests exist within every classroom. Finally, this review merges the two aspects of the research and explains why this researcher is using Habermas’ theory of cognitive interests as a foundation of learning that can be identified and investigated in an adult education setting.

Jürgen Habermas

Though many American educators are not familiar with Habermas, his work is beginning to influence educators around the world (Grundy 1987). Educators from other countries seem to recognize his importance. For example, "This man is not only the most influential social and philosophical thinker in Germany today, but also one of the intellectual giants of the century" (Wilby, 1979, p. 667). Ralf Dahrendorf, director of the London School of Economics adds, "He is the only person I can think of in our generation who is likely to have a major place in intellectual history" (in Wilby, 1979, p. 667).

Just who is this philosopher and sociologist who is such a profound thinker that he can have an important impact on education even though he never really addresses education directly? Born in 1920, and a teenager at the end of World War II, he could not help but be profoundly affected by Nazi Germany and the actions of his countrymen during the war. As Bernstein (1985) put it, "This experience has had a lasting effect on him and has always been central for his work" (p. 2).

Like other German youth of the first half of this century, he studied Marx and Hegel extensively. Roderick (1986) saw the link to Marx,

Habermas's own work, read as a supplement to Marx and not as a replacement, also contributes to this continuation of radical theory by forging a link between Marxism and a radical democracy in which all political decisions are subjected to the discussions of a reasoning public. (p. 173)

He was also a reader of John Dewey and other American pragmatists when the barriers to the West were broken down after the War. Bernstein (1985) stated, "Habermas was

deeply influenced by the American pragmatic thinkers, especially Pierce, Mead, and Dewey” (p. 3).

According to Shalin (1992), “Dewey’s writings were particularly instrumental in sensitizing Habermas to the continuity between scientific inquiry and democratic discourse” (p. 246). He went on to add, “Mead caught Habermas’s attention for some of the same reasons that Dewey did, but in addition to Mead’s progressive democratic agenda, Habermas found in his writings a theory that ‘elevated symbolically mediated interaction to the new paradigm of reason’” (p. 247). Shalin summed up the pragmatic influence on Habermas by stating: “A cursory look at Habermas’s theory reveals the measure of his debt to pragmatism. We find in his work the same mixture of historical optimism that harks back to critical idealism and tough-minded realism found in Progressive Era pragmatism” (p. 249).

There are those who criticize Habermas as well. The very optimism that Shalin praised above is seen by others as too “Utopian” and “idealistic” to have a place in the real world of education. Hart (1990), for example, said Habermas is too rational and that his theory is so Utopian that he does not see the realities of power and culture. Nielsen (1992) agreed when he observed: “Habermas’s account seems just too unworldly, too far removed from the historical and cultural realities about the differences between people and between societies. Habermas’s account reads more unity into humankind than it is plausible to expect” (p. 276). This researcher, being an educational optimist, tends to dismiss the seemingly constant criticism that an educational idea or new concept is too idealistic. Mezirow (1994) seemed to agree and come to the defense of Habermas to such criticism when he stated:

The ideal conditions of learning are also the ideal conditions of education. They are never achieved in real life but are important as standards against which to

judge educational efforts and for setting norms that protect participants from the inequalities in power and influence that commonly corrupt discourse. (p. 226)

Habermas was also influenced by the writings of Hanna Arendt. In an address in New York, in 1980, he paid tribute to her influence in his writings (Young, 1990, p. 26). From her major work, The Human Condition (Arendt, 1958), come several ideas that Habermas has incorporated into his writing. First, she talked about the ability of humans to think as the highest and purest activity of which men are capable (p. 6). She went on to describe the human condition in this rather unique way: "Plurality is the condition of human action because we are all the same, that is, human, in such a way that nobody is ever the same as anyone else who ever lived, lives or will live" (p. 8). Finally, she provided a link from Aristotle to Habermas in her distinction between praxis and poiesis (p. 195). Whereas praxis is acting or doing based on prudent practical judgments (Habermas' practical interest), poiesis is making, involving technique and craftsmanship which results in a tangible product (Habermas' technical interest). The ideas of Hanna Arendt are quite evident in Habermas' theory of knowledge and human interests.

Knowledge and Human Interests

In the preface to Knowledge and Human Interests, Habermas (1971) begins with his main reason for writing this book. "I am undertaking a historically oriented attempt to reconstruct the prehistory of modern positivism with the systematic intention of analyzing the connections between knowledge and human interests" (p. vii). Undertaken as a counter-argument to the prevalent positivist attitude of the time, Habermas sought not to totally eliminate these ideas but to show that there were also other ways of constituting knowledge.

There are three categories of processes of inquiry for which a specific connection between logical-methodological rules and knowledge-constitutive interests can be demonstrated. This demonstration is the task of a critical philosophy of science that escapes the snare of positivism. The approach of the empirical-analytic sciences incorporates a *technical* cognitive interest; that of the historical-hermeneutic sciences incorporates a *practical* one; and the approach of critically oriented sciences incorporates the *emancipatory* cognitive interest. (Habermas, 1971, p. 308)

When referring to interests, Habermas (1971) explained, “the expression ‘interest’ is intended to indicate the unity of life context in which cognition is embedded” (p.9). He adds: “Either the interest presupposes a need or it produces one” (p. 198).

“ ‘Cognitive interest’ is therefore a peculiar category. . . For knowledge is neither a mere instrument of an organism’s adaptation to a changing environment nor the act of a pure rational being removed from the context of life” (p. 197).

Though some authors use different words, Young (1990), for example, refers to control, understanding, and freedom from dogma (p. 32), Roderick (1986) to labour, interaction, and power (p. 53), and Bullough (1984) to work, communication, and emancipation (p. 6), there seems to be a great deal of consistency in the way Habermas’ three knowledge-constitutive interests are interpreted.

Grundy (1987) provides perhaps the clearest discussion of what each interest actually means to educators. As Li and Reigeluth (1995) put it, “Grundy (1987) presents a very good interpretation of these three human interests” (p. 5). She sums up each of the interests as follows. “Put succinctly, the technical interest is: *a fundamental interest in controlling the environment through rule-following action based upon empirically grounded laws*” (p. 12). Discussing the practical interest, she adds, “This interest could

be defined in the following way: *the practical interest is a fundamental interest in understanding the environment through interaction based upon a consensual interpretation of meaning*" (p. 14). And, finally, "The emancipatory cognitive interest could be defined as follows: *a fundamental interest in emancipation and empowerment to engage in autonomous action arising out of authentic, critical insights into the social construction of human society*" (p. 19).

Habermas and Grundy both view the emancipatory interest as the highest form of knowledge and the goal toward which educational efforts should be directed. For example, in Habermas' (1971) words, "In self-reflection knowledge for the sake of knowledge attains congruence with the interest in autonomy and responsibility. The emancipatory cognitive interest aims at the pursuit of reflection as such." He adds as one of his five main theses, "in the power of self-reflection, knowledge and interest are one" (p. 314). Grundy (1987) goes even further when she says, "There must be an interest in freeing persons from the coercion of the technical and the possible deceit of the practical. This is the interest in emancipation, the so-called emancipatory interest" (p. 17).

In spite of this focus on the emancipatory interest, this research proceeded with the belief that none of the three interests provides a more effective way of learning than the others, they are merely different. Ewert (1991) agreed: "When any one form of knowledge is presumed to be the best, regardless of the question at issue, then the approach is ideological--not scientific" (p. 376). Li and Reigeluth (1995) add:

If we limit ourselves to only one single interest, we will lose sight of other possibilities. The critical point is our ability to determine which mode of actions to take when coping with a certain problem. It is also essential to identify the conducive situations for each of the three interests to play. More important, the kind of efforts required by each interest should be recognized. (p.14)

Finally, Kimpston (1992) discussed the different ways of knowing: "Each perspective has its own integrity and logic, and each successive perspective respects that integrity within a broader formulation of what it means to know" (p. 170). A thorough description of each of the three interests follows.

Technical Interest

The main purpose or objective [of traditional education] is to prepare the young for future responsibilities and for success in life, by means of acquisition of the organized bodies of information and prepared forms of skill which comprehend the material of instruction. Since the subject matter as well as the standards of proper conduct are handed down from the past, the attitude of pupils must, on the whole, be one of docility, receptivity and obedience. (Dewey, 1938, p. 18)

Dewey's influence on Habermas was documented earlier in this review, but this description of traditional education also serves as a definition of what Habermas refers to as the technical interest. Habermas does not object to this form of knowledge, he does however, object to the positivists who preach it as the only form of knowledge. In his words, "Positivism marks the end of the theory of knowledge" (1971, p. 67). Just how strong is this positivist conviction? Aber (1991) states, "We live in a culture that worships the technical interest, placing it in a position that used to be reserved for God and religion" (p. 129). In response to these deep beliefs, "Habermas was not denigrating or criticizing this form of knowledge. His point is that it is only *one* type of knowledge; it is not to be taken as the canonical standard for all forms of knowledge" (Bernstein, 1985, p. 9). Dewey (1931) added this warning: "As long as we worship science and are afraid of philosophy we shall have no great science; we shall have a lagging and halting continuation of what is thought and said elsewhere" (p. 12).

The technical interest is grounded in the fundamental human needs of survival and earning a living. The foundation is in the empirical-analytic sciences where things are proven through observation and experimentation. (Grundy, 1987) They are then generalizable to other situations. In Habermas' (1971) own words, "Empirical-analytic knowledge is thus possible predictive knowledge" (p. 308). The primary purpose of education becomes to prepare the learner to control and manage the environment. Several authors (e. g., Pusey, 1987 and Mezirow, 1981) even refer to this interest as "work." The teacher-learner relationship becomes one of the student observing facts and learning skills from the teacher.

This knowledge is seen as instrumental and as a means to the desired end (Ewert, 1991). The knowledge is also assumed to be value free (Schubert, 1986). The teacher becomes the deliverer of a directed curriculum and learning is controlled through the control of teaching, where the most efficient route to facts is the best route to travel. Grundy (1987) provides a recap, "For Habermas the fundamental interest which guides empirical-analytic science is an interest in control and the technical exploitability of knowledge (the technical cognitive interest)" (p. 12). "This model is best exemplified in curriculum theory by the well known Tyler Rationale" (Hlynka & Belland, 1991, p. 7). Tyler (1949) asked four simple questions which have proven to be the cornerstone of the technical paradigm:

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether these purposes are being attained? (p. 1)

Habermas (1971) points out two of the major weaknesses of viewing the technical interest as the only path to knowledge. First, "Science explains the course of nature but can never give man commands. Inclination, love, pleasure, pain, exaltation, exhaustion--science knows nothing of all this. What man lives and experiences he must interpret, and thus evaluate, on some basis" (p. 292). Second, "No matter how far our power of technical control over nature is extended, nature retains a substantial core that does not reveal itself to us" (p. 33). Davis & Schwimmer (1981) sum up the ideas many, including Habermas, have about this positivist mindset: "Still there is a feeling that this isn't all there is to it, that there must be something more to learning and thinking than taking in information and putting it out again" (p. 376). Though not the only way, the technical interest is one way of learning. Another way to constitute knowledge is by using what Habermas calls the practical cognitive interest.

Practical Interest

Whereas the basic orientation of the technical interest is towards control, that of the practical interest is towards understanding (Grundy, 1987, p. 12). As Dewey said: "Understanding may not ensure complete agreement, but it gives the only sound basis for enduring agreement" (Winn, 1959, p. 141). "The practical human interest entails historical and hermeneutic ways of knowing that represent the physical, social, and cultural worlds as 'texts' which have to be interpreted in order for meanings to emerge" (Streibel, 1991, p. 4). Habermas (1971), himself, explains, "The historical-hermeneutic sciences gain knowledge in a different methodological framework. . . . Access to the facts is provided by the understanding of meaning, not observation" (p. 309).

"In order for knowledge to be made, human interaction must take place. For Habermas, interaction is a nonreducible type of action requiring a distinctive set of categories for the description, explanation, and understanding of it" (Bernstein, 1976,

p. 195). Humans not only want to exist within their society, they must exist within that society (Streibel, 1991). For these reasons, every student brings a unique perspective into each learning opportunity. The curriculum designer and the teacher must realize that each student may interpret each learning situation differently.

In the practical interest, the distinction between teacher and learner, which was very clear in the technical interest, begins to blur as teacher becomes learner and learner becomes teacher. The teacher must provide an atmosphere in which each learner understands the environment so he/she can learn to interact with it. To accomplish this, the student observes each situation as a whole and attempts to make meaning from it, greatly influenced by life's experiences. Judgment becomes more important than skills, meaningful action replaces correct behavior (Streibel, 1991), and the teacher provides guidance rather than direction. In summary, the practical interest "calls for an educational approach which focuses on helping learners interpret the ways they and others with whom they are involved construct meanings, ways they typify and label others and what they do and say as we interact with them" (Mezirow, 1981, p. 18).

In curriculum theory, this view is most clearly stated in the work of Joseph Schwab who suggests that the four commonplaces of learning form the starting point of developing a true practical knowledge (Hlynka & Belland, 1991, p. 7). Schwab (1973) explained the importance of each of these commonplaces: "Defensible educational thought must take account of four commonplaces of *equal* rank: the learner, the teacher, the milieu, and the subject matter. None of these can be omitted without omitting a vital factor in educational thought" (pp. 508-509).

Some modern philosophers have gone so far as to argue that hermeneutic interpretation should be the fundamental form of knowledge. "It is argued that hermeneutical understanding is a pre-eminent form of knowledge upon which action can proceed" (Grundy, 1987, p. 59). In much the same way that he critiques the positivists

who placed the entire educational world within the technical interest, Habermas “is just as critical of the claim that the historical-hermeneutic disciplines provide the most fundamental knowledge of man and the world” (Bernstein, 1976, p. 197). The technical interest is only one way of learning, not the only way. The same is true of the practical interest. There is also a third way of learning that Habermas refers to as the emancipatory cognitive interest.

Emancipatory Interest

Grundy (1987) said, “The emancipatory interest is perhaps the hardest of these conceptual categories to grasp, but it is in the identification of this interest that Habermas has made his most original contribution to modern philosophy” (pp. 15-16). Later, she said, “While the other two interests are concerned with control and understanding respectively, the emancipatory interest is concerned with *empowerment*, that is, the ability of individuals and groups to take control of their own lives in autonomous and responsible ways” (p. 19). Ewert (1991) added, “Whereas empirical and interpretive social sciences describe the world as it is, critical theory tries to understand why the social world is the way it is and, through the process of critique strives to know how it should be” (p. 356).

Habermas views honest self-reflection as the only path to true emancipation. “Self-reflection brings to consciousness those determinants of a self-formative process of cultivation and spiritual formation which ideologically determine a contemporary praxis of action and the conception of the world” (Habermas, 1973, p. 22). By focusing on the ways that people struggle to change their social, economic, and cultural conditions of existence towards forms that are more truthful, more just and more free, the emancipatory interest becomes not some abstract external idea but a potential within each individual waiting to be realized (Streibel, 1991). Even though this emancipation must come from within, an emancipatory interest does not deny the importance of the

teacher. In fact, it becomes incumbent upon the teacher to bring enlightenment to others and provide the conditions for their emancipation (Grundy, 1987, p. 107). "Here the emphasis is on helping the learner identify real problems involving reified power relationships rooted in institutionalized ideologies which one has internalized in one's psychological history" (Mezirow, 1981, p. 18).

Even though this human interest does not call for the rigid structure of the technical classroom, it does not imply chaos in the classroom either. Young (1988) warned, "There should be no comfort in this analysis for those who advocate a completely 'child-centered' or 'free' approach to schooling" (p. 58). He went on to add, "There is no reason to believe, in anticipation of detailed analysis of socially situated and historically located action, that some sort of disorderly free-for-all must be the result of applying this sort of theory to teaching/learning" (p. 59). Instead of a chaotic free-for-all, the emancipatory classroom is a learning environment where "an ethos of support, encouragement, non-judgmental acceptance, mutual help and individual responsibility is created" (Mezirow, 1981, p. 19).

Through self-reflection, each individual must examine his/her own value systems and concepts of justice so he/she can understand the many constraints that have become an accepted part of his/her life. Only through this understanding will they be able to transcend constraints imposed by socio-economic class, race, gender, or any other constraint they have accepted in the past. "Emancipation is from libidinal, institutional or environmental forces which limit our options and rational control over our lives but have been taken for granted as beyond human control" (Mezirow, 1981, p. 5).

The teacher must understand that "to realize emancipation, human beings have to become critically conscious and aware of how they construct their current knowledge, beliefs and practices and socially reconstruct their knowledges, beliefs, and practices" (Streibel, 1991, p. 9). The teacher must prepare the learner to be liberated from the

environment, through the ability to think and act critically. The teacher must also remember that "Teaching with the emancipatory interest in mind involves, as much as possible, an acceptance of views of students, no matter how wrongheaded those views might at first seem" (Aber, 1991, p. 133). Through enlightenment of the learner, actions to reorient power can be taken in order to achieve emancipation. Students must be allowed to make mistakes and learn from them. As Dewey (1933) said, "The person who really thinks learns quite as much from his failures as from his successes" (p. 114). Aber (1991) summed up this interest, "If the technical interest asks *how*, and the practical interest asks *what*, the emancipatory interest asks *how* and *what* and *why*" (p. 128).

Importance to Education

Habermas' "explorations into the nature of human knowledge and theory/practice relationships were not written within a context of educational theory, nor do they arise directly out of educational considerations" (Grundy, 1987, p. 8). His ideas do, however, have a great deal of importance in the discussion of education, especially when the discussion is concerned with how people learn. Ewert (1991) concluded, "the range of issues covered by the literature reviewed indicates that Habermas has influenced not only thinking about pedagogical and administrative theory but also thinking about the role and function of education and educational practice in society" (p. 8). He added, "Habermas will have an increasing impact on North American educational thought and practice" (p. 8).

Discussing Habermas' knowledge-constitutive interests, Streibel (1991) stated, "Jürgen Habermas provides the most complete articulation of a framework that deals with different types of relationships between theory and practice" (p. 4). Surely, a theory of knowledge-constitutive interests has a place in educational thought. After all, in many ways, education is the art of helping students discover the best ways to constitute

knowledge. Mezirow (1981) spoke of Habermas' importance when he said, "I believe Habermas' work is seminal for understanding both learning and education" (p. 4).

Though many authors stress the importance of Habermas to education, there is also the question of the classroom as the proper setting for the application of his theories. Young (1990) developed an entire pedagogy based on the ideas of Habermas answering this question. "While systems of public education, such as school systems, or systems of higher education, are not the only organizational medium in which such learning could be realized, they are a potential means" (p. 42). What should the teacher do to incorporate these theories into the classroom? Aber (1991) offered a suggestion. "Teachers might begin by simply using Habermas's theory of cognitive interests as a way of connecting their goals to their methods of instruction" (p. 130). Once this is accomplished, "Habermas's theory of cognitive interests could then become a powerful framework for judging what kinds of knowledge produces what kinds of student texts" (p. 135).

In addition, Schubert (1986), explained how well these ideas fit into some of the most widely used curriculum theories.

His three categories (empirical-analytic, hermeneutic, and critical) can be related to the foregoing discussion of paradigms in curriculum literature. The empirical-analytic relates quite directly to the theoretic paradigm that Schwab criticizes and to that which the Tyler Rationale has become as it was merged with positivistic science. Schwab's practical paradigm is largely in harmony with the hermeneutic . . . The critical perspective is a basis for emancipatory theorizing. (p. 183)

Finally, Mezirow (1981) tied the theories of Habermas not only to education but to adult education. While providing a detailed charter of adult learning based on Habermas' three knowledge-constitutive interests, he said:

By clearly differentiating these three interrelated but distinct "knowledge constitutive" areas of cognitive interest, Habermas has provided the foundation for formulating a comprehensive theory of adult education. As each domain has its own learning goal (viz., learning for task-related competence, learning for interpersonal understanding and learning for perspective transformation), learning needs, approaches for facilitating learning, methods of research and program evaluation are implied or explicit. (p. 16)

Regardless of what any educator thinks about Habermas and his theories, it appears that they are here to stay. This review of the literature led this researcher to the conclusion that his impact is unmistakable and will be prominent in many educational discussions of curriculum and instruction for several years. In his biography of Habermas, Pusey (1987) summed up his contributions:

Habermas has used all his brilliance and scholarship to take his readers beyond his own views and into carefully established new points of reference within classical texts that he has brought to life in so many strikingly new perspectives. He has established new foundations and this together with the enormous scope of the theory bode well for its future. . . . Whether or not we find 'answers' in Habermas's theory is for each reader to determine for his or herself. Each will find parts of his work that are impenetrable or unacceptable. But all will find a theory that joins the inner world of our shared subjectivity with the object world

‘out there’ and, further, an ordered set of concepts and arguments with which to fathom our own social nature and its possibilities. We may not accept what we read, but who dares ask a single scholar to offer more? (pp. 121-122)

Individual Differences

“Individual differences have intrigued and challenged educators for centuries. On the one hand, our profession is motivated by the understanding and application of this concept. On the other hand, practical response to individual differences has almost entirely eluded us” (Guild & Garger, 1985, p. viii.). In the same way that this research took a neutral stance on Habermas’ three knowledge-constitutive interests, individual differences in learners was accepted and encouraged. As Cornett (1983) said, “we realize that there is no right or wrong way to learn” (p. 27). Educators must realize that “the key to helping more students achieve in our schools would seem to involve offering them different ways to reach common goals” (Keefe, 1988, p. 41).

According to the literature, it is very important for every teacher to know and understand his/her own cognitive interest and attempt to understand the various experiences that the different learners bring into the classroom. As Kaplan and Kies (1995) explained: “The classroom teacher needs to be aware of just how his/her teaching style does impact student learning. The process of learning is unique to each learner. Each learner has a different learning experience” (p. 29).

The process of teaching is also unique to each teacher. A major assumption of this study was that the cognitive interest of the teacher affected the way he/she related to learners. The literature is clear on this issue, the cognitive interest of a teacher is an unavoidable part of who he/she is when he/she enters the classroom. Guild and Garger (1985) observed that, “we each tend to have a preference for one way of looking at the world. The kind of perception we favor most often becomes our window through which

we observe life” (p. 18). “In a nutshell, we tend to teach the way we learn, unless there is a conscious reason to do otherwise (Cornett, 1983, p. 14). Barbe and Swassing (1979) agreed that, “We teach as we learn best, not as we were taught. Teachers tend to project their own modality strengths into their selection of materials, teaching strategies and procedures, and methods of reinforcement” (cited in Guild & Garger, 1985, p. 66). Zinn (1983) added, “Beliefs about education do provide some basis for selecting instructional content, establishing teaching/learning objectives, selecting and/or developing instructional materials, interacting with learners, and evaluating educational outcomes” (pp. 3-4).

The way a teacher interacts with students is even more deeply entrenched into who he/she is than that. As Galbraith (1990) pointed out:

There is evidence from a number of disciplines to suggest some positive relationship between an individual’s beliefs, values, or attitudes and the decisions and actions that make up one’s daily life. . . . In an attempt to make sense out of the world, people formulate beliefs upon which they can rely as guides for the future. Individual beliefs generally fit into groups or categories with other similar beliefs, forming belief systems which, as a whole, comprise a life philosophy. Generally, adults have formulated some life philosophy which underlies their interpretation of the world and their actions within it. (p. 40)

This philosophy of life provides a framework by which to live and act (Galbraith, 1990, p. 40). For teachers, this contributes greatly to an educational philosophy as a great deal of their living and acting takes place preparing to teach, teaching, and evaluating learning. Galbraith explained, “When the adult educator engages in the practice of education, certain beliefs about life in general are applied to the practice” (p. 40). Young

(1990) adds, "Not surprisingly, the pattern of classroom communication is often mirrored in teachers' beliefs about knowledge" (p. 95).

When a teacher makes conscious decisions about how he/she will teach a certain learner or group of learners he/she must be aware that "as a teacher, you do not randomly select your teaching style, and you do not constantly change your style. Instead, your style is linked to your educational philosophy which in turn is a subset of your overall life philosophy" (Galbraith, 1990, p. 89). Habermas (1971) agreed when he stated:

The sort of philosophy one chooses thus depends on what sort of person one is.

For a philosophical system is not a pile of junk that could be discarded or retained at our whim; rather, it is inspired by the soul of the man who possesses it.

(pp. 208-209)

Phillips (1981) adds: "It should be noted that we cannot believe what we wish to believe; we believe what we do believe" (p. 101).

"The ideal of American education remains the same: Schools exist for all students" (Keefe, 1988, p. 45). Every learner and every teacher has his/her own cognitive interest. Sometimes teachers tend to ignore this individualism and find themselves trapped into thinking that every student learns best in the same way that the teacher does. "Perhaps it's our nature as human beings to assume that other people function and see the world as we do, and are motivated by the same things that motivate us. We know now that it isn't so" (Stuart, 1992, p. 94). As Kaplan and Kies (1995) warned: "Educators often view instruction and student learning as direct correlates. . . . If the teacher is working hard, students should learn. If they do not, it is traditionally the students fault not the teachers" (p. 29). Loper (1989) adds:

If a teacher teaches and evaluates in only one cognitive mode, he or she is adequately serving only those students who prefer to learn in that mode. To give every learner the opportunity to succeed, teachers can expand their repertoires to include a variety of cognitive modes. (p. 53)

Experienced teachers know through common sense and from work with many different learners that students learn in different ways. This naturally leads these experienced teachers to attempt different methods in their teaching, often with amazing results. "It is sometimes astonishing to see how improved our understanding can be when something is expressed in a different way" (Guild & Garger, 1985, p. 62).

To reach all learners, "we must be open to the ideas, willing to rethink our biases, willing to try new approaches, and willing to learn in the process" (Keefe, 1988, p. 45). At the same time, teachers must avoid the temptation to get wrapped up in all the various theories and styles and lose the focus of the desired learning experience. Kramlinger said that it isn't so important that you identify the right interests or that you have the right theory, "what's important is that you apply *some* theory." Any theory that encourages individual learning will encourage the use of a variety of activities, which will help everyone learn better. (in Stuart, 1992, p. 88)

"The addressee of Habermas' theory is clearly universal" (Young, 1990, p. 40). *All* curriculum developers, teachers, and learners "must do a better job of recognizing the assumptions that underpin our particular versions of the 'truth.' We must explicitly search for the way in which our own human interests are served by the use of particular knowledge forms" (Tinning, 1992, p. 12). Habermas' theory provides the necessary framework for doing just that through the use of his three cognitive interests. As Aber (1991) explained, "whenever he asks himself how knowledge is produced, Habermas

begins with some basic questions: What interests are being served by this knowledge--who or what stands to benefit from it and why?" (p. 126)

What happens at a school when people recognize differences in students and are willing and able to deal with them? "First and foremost, diversity of human personality is accepted as the norm" (Guild & Garger, 1985, p. 22). They add:

Perhaps more importantly, we stop the futile search for the one right answer to issues and problems in education. There cannot be one best way to run schools, a right way to design a report card or a teacher evaluation, a best reading text for every student, a best physical design for a classroom, or of course, a best way to teach. (p. 23)

This diversity should be celebrated at all levels of education. As this research focused on adult learners, the importance of cognitive interests in a higher education setting is a key factor. As Messick and Associates (1976) told us, "Education, especially higher education, should actively foster individual fulfillment and hence should adapt to, and perhaps even capitalize on and extend, these essential human differences to promote greater learning and creativity" (p. 1). The literature seems to support the belief that individual differences are an important factor in education. Next, this review examined the concept of matching learners and teachers according to their cognitive interests.

Matching Learners and Teachers by Cognitive Interest

"Matching seems to be important in our world" (Cornett, 1983, p. 38). This research was interested in the importance of matching learners and teachers in the classroom. Several questions came to mind. Is it important? Is it the best for the learners? The literature provides mixed results. For example, Dunn, et al. (1995), believe very strongly that matching increases student performance. "Given responsive

environments, resources, and approaches, students attain statistically higher achievement and attitude test scores than students with dissonant treatments” (p. 354).

Smith and Renzulli (1990) agreed when they based their educational approach on “the contention that students are differentially susceptible to educational environments and that learning will be maximized when the appropriate form of instruction is matched to the individual student” (p. 46).

On the other hand there are those who believe that matching is not a panacea for student learning. Cornett (1983), for example, reviewed twenty-three studies on matching for achievement and found that seven failed to show any relationship while the other sixteen showed only a moderate relationship between matching and achievement. She concluded that “matching produces inconsistent achievement outcomes” (p. 41). While realizing that an understanding of individual differences is important and matching may or may not provide outstanding results all of the time, matching is not always possible and may not even make sense in all situations. Cornett explained that it would be unrealistic as well as undesirable, to match learners with teachers all the time. Instead of trying to match all students, we should encourage the flexing capabilities of both teachers and students. She calls this flexing on both sides “learning to learn” (p. 19).

There certainly appeared to be plenty of room for more research on cognitive interests and their impact in the classroom. This study certainly did not close the loop in cognitive interest research, but may serve as a foundation on which others may build. It probably exposed more questions, as well, because as Cornett (1983) observed, “Over the years we have begun to realize that the more we learn about learning, the more we really need to know” (p. 7).

Habermas’ Cognitive Interests and Adult Learners

From the literature reviewed in the previous sections, it appears that a teacher’s cognitive interests may influence his or her way of teaching and a student’s cognitive

interests may influence his or her way of learning. In addition, a match or mismatch in cognitive interests between teacher and student may have important consequences for the learning process. "Interestingly enough, the evidence available on these issues comes almost entirely from studies in which the students were of elementary or high school age. Essentially no work has been done with students on the college or graduate school levels" (Messick & Associates, 1976, p. 57). This is one reason why this particular research study was necessary.

Adult learners are different. Galbraith (1990) reviewing the literature on adult education realized that adults are different from children and youth as learners in many respects. "Therefore different methods from those of traditional pedagogy would be likely to be more effective with them. . . . A shift of focus by adult educators away from methods of teaching to methods of facilitating learning" (p. ix.) is necessary to effectively educate adult learners. He went on to explain the current thinking about adult learners:

Two conflicting views of adult learners are fairly widespread. The first is held by Main Street Americans: it represents adult learners as less capable than younger learners. . . . The second is held by many professional educators of adults; it represents adult learners as super learners. . . . The truth about adult learners rests somewhere between the negative stereotype and the super learner idea. (p. 23)

The variety of experiences that a group of adults will bring into the adult learning environment will certainly challenge the adult educator.

It is impossible to be aware of each and every individual difference that may exist among a group of adult learners. The goal is to arrive at a realistic balance between recognition of individual idiosyncratic characteristics and identification of those normative characteristics that allow us to consider adult learners as a group. (Galbraith, 1990, pp. 25-26)

Smith and Renzulli (1990) agreed, stating: "Ideally, the experiences we provide should be tailor-made, if not for individual students, at least for different types of students" (p. 44). To accomplish this, the adult educator must assess his/her students both as a group and as individuals. "Assessment, however, must be based on a defensible theoretical framework" (Keefe & Ferrell, 1990, p. 57). This is where the theory of Jürgen Habermas became important. This researcher believed his theory of knowledge-constitutive interests provided the necessary theoretical framework. In his article, outlining an adult education program based on this theory, Mezirow (1981) described it as follows:

The critical theory of Jürgen Habermas is presented as a learning theory positing three generic domains of adult learning, each with its own interpretative categories, ways of assessing knowledge claims, methods of inquiry and, by implication, each with its own distinctive learning modes and needs. (p. 3)

He further justified Habermas' ideas as a valid theory when he concluded that "Habermas' analysis of primary cognitive interests helps us demythify the learning process as well as our way of thinking about facilitating learning" (p. 17). Bernstein (1976), referring to Habermas' theory, added, "they determine the categories relevant to what we take to be knowledge, as well as the procedures for discovering and warranting

knowledge claims” (p. 192). Jürgen Habermas’ theory of cognitive interests provided an excellent framework for this study. The following chapter describes, in detail, the methodology used to investigate this theory.

III

METHODOLOGY

This study consisted of three major phases. The first phase was a thorough review of the literature as reported in Chapter II. This review of the literature revealed no studies that investigated the cognitive interests of Habermas in the classroom. For this reason, there was no instrument available to measure the presence of these interests in teachers or students. Development of a valid and reliable instrument to classify each teacher and student as either technical, practical, or emancipatory was the second phase of this research. Once this researcher was confident that the instrument was valid and reliable, the third and final phase was accomplished. Use of the instrument to investigate an adult education setting and answer the research questions of this study was the final phase of this research. The results of this investigation are reported in Chapter IV and implications and recommendations are discussed in Chapter V.

After presenting the foundation of this study by describing the setting and subjects involved, this chapter contains a detailed description of the methodology used to develop the Cognitive Interest Inventory, as well as an explanation of the methods used to validate the instrument and measure its reliability. Finally, the procedures used to investigate the three hypotheses that were examined in this study are explained.

Institutional Setting

Located at Maxwell Air Force Base, Alabama, Air Command and Staff College (ACSC) is the Air Force's intermediate professional military education (PME) school. According to the ACSC Academic Year (AY) 97 Curriculum Plan, the school:

Prepares field grade officers of all services (primarily majors and major selects), US civilians, and select international officers to assume military and government positions of higher responsibility. Geared toward teaching necessary leadership skills, ACSC focuses on shaping and molding tomorrow's airpower leaders. The college's academic environment stimulates and encourages free expression of ideas as well as independent, analytical, and creative thinking. (p. 1)

The stated mission of the school is to "educate midcareer officers to lead in developing, advancing, and applying air and space power in peace and war" (ACSC, 1996, p. 1). This graduate-level course (The American Council on Education reviewed the resident and associate curricula and has approved 27 semester hours of graduate credit for all students.) convenes for ten months beginning in August each year with graduation the following June. The ACSC Curriculum Plan summarizes the course as follows:

It remains a book and technology-based curriculum exploring the works of many great thinkers and strategists--military and civilian. The students begin their studies addressing the large conceptual issues of war and conflict and end by applying their knowledge of air and space power in a practical application. (ACSC, 1996, p. 1)

This school was selected as the setting for this study for several reasons. First, the average age of the United States Air Force students was 36.6 years, which certainly qualifies as an adult education setting. As stated in the literature review, research in adult education is an area that deserves more attention. In addition, the ACSC curriculum is designed and developed in a way that makes enactment of the curriculum in each of Habermas' three cognitive interests possible. As a curriculum developer,

teacher, and course director at ACSC for three years, this researcher observed the curriculum enacted in the classroom using all three interests. Finally, the college was very interested in this research and this researcher had full support of the Commandant and the Dean of Education and Curriculum. Based on this support, a very high inventory return rate was anticipated.

Classroom Setting

The students were divided into 44 seminars of either 13 or 14 students. This research was concerned with the first three courses of the academic year, War and Conflict, War Theory, and Strategic Environment. Each seminar had a different teacher for each of the three courses. This provided the opportunity for three cognitive interest matches or mismatches for each student. A synopsis of each of these courses follows:

War and Conflict

This course sets the stage for the curriculum by: (1) Introducing and defining the concepts (such as actors, motives, objectives, levels of war, and termination strategy) essential to the study of the strategic context of the operational level of war; and (2) clarifying the distinction between war, conflict, and conflict termination. War, conflict, and conflict termination are interdependent elements, whose nature and meaning can only be understood fully as part of the social and cultural context in which they occur. (ACSC, 1996, p. 2)

War Theory

The War Theory course is designed to expose the students to the broad spectrum of war theory, defined as the body of thought relating to how societies wage war. The goal is to encourage critical thought about war and provide factual and

analytical tools for examining it. It is not a military history course *per se*, but military history is used as a lens through which to examine the development, application, and evolution of key concepts concerning the nature of military power and its application that have withstood the test of time, as well as understanding why others wound up in the “dust-bin of history.” (ACSC, 1996, p. 3)

Strategic Environment

This course introduces strategic thought, analysis, and introduces power projection instruments. It begins the process of making security assessments and analyses of hostile and friendly centers of gravity. This course gives students the opportunity to look at the basic civil/military leadership power relationships in state and non-state entities. The students are introduced to illustrative case studies as examples of centers of gravity. (ACSC, 1996, p. 3)

Examinations

The dependent variable used in the investigation of all three hypotheses in this study was the student's grade on the end of course examination for each course. ACSC's “evaluation program is designed to give the students and the school feedback on students' progress and the effectiveness of instruction” (ACSC, 1996, p. 8). To accomplish this task, each course had a final examination. For the three courses of interest to this study, each examination required a written essay response designed to measure the extent to which students were able to, “reach higher levels of creative, analytical thought and a deeper understanding of the requisites of command and the application of air and space power” (ACSC, 1996, p. 1). A copy of the three

examinations can be found in Appendix C. As an example, the War Theory final examination consisted of two questions both requiring written responses limited to five pages each. Students were given 24 hours to complete the examination and they could use all books and computer programs issued by the school. To further illustrate the type of examination question used at ACSC, question number two of the War Theory Examination read as follows:

Conduct a Clausewitzian critical analysis of the development of British armor theory in the interwar years (1918-1939). As part of your critical analysis, discuss the theory's later application with respect to other theories, and explain and defend to what extent it represents a Military-Technical Revolution (MTR) or a Revolution in Military Affairs (RMA).

Subjects

Subjects investigated in this study were the United States Air Force officers of the ACSC class of 1997 ($n = 387$) and the teaching faculty for the War and Conflict ($n = 31$), War Theory ($n = 30$), and Strategic Environment ($n = 31$) courses. The ACSC class of 1997 had a total enrollment of 601 students which included 387 United States Air Force officers, 36 United States Navy officers, 44 United States Army officers, 10 United States Marine Corps officers, 11 United States Air Force Reserve officers, 14 Air National Guard officers, 19 United States Department of Defense civilians, and 80 international officers from around the world.

This research included only the 387 United States Air Force students in order to provide a more homogenous group for the study. Though from a wide variety of educational backgrounds and career fields, the subjects were similar in several respects. First, they were all college graduates and 94 percent had a masters degree or higher. In

addition, they were all commissioned through one of three sources, the United States Air Force Academy (22 percent), Officer Training School (31 percent), or Air Force Reserve Officers Training Corps (44 percent). Each of these commissioning sources stressed similar values and provided a similar background in military customs and courtesies. Most of the students were similar in age, and each had been on active duty for about the same amount of time. Students normally come to this school shortly after their selection to major, with about thirteen to fourteen years of military service. The average years of service for this class was 13.62 years. Finally, 97 percent of the students had attended Squadron Officer School (SOS), so they were familiar with Professional Military Education and Air University, home of SOS and ACSC. (All of the data in this section came from the ACSC Resident Class AY 97 Demographics, which can be found in Appendix B).

The teachers of the three courses investigated by this study came predominantly from the United States Air Force (77 percent). The teachers of the War and Conflict course included 26 United States Air Force officers, 3 United States Army officers, and 2 civilians. The teachers of the War Theory course included 21 United States Air Force officers, 6 civilians, 2 United States Navy officers, and 1 United States Army officer. Finally, the teachers of the Strategic Environment course included 24 United States Air Force officers, 3 civilians, 1 United States Army officer, 1 United States Marine Corps officer, 1 Canadian Air Force officer, and 1 Royal Air Force officer (Great Britain). Based on familiarity with the school and faculty, this researcher made the assumptions that very few of these teachers had studied education and that they had a wide variety of academic backgrounds. Demographic questions on the inventory were designed to test the validity of these assumptions.

The lack of education courses by the instructors was viewed as a possible benefit to this study. Based on experience with both educators and non-educators, this

researcher had observed that professionals who have studied education tend to believe responses focusing on the emancipatory cognitive interest are the most acceptable answers for educators to give. This research assumed that ASCS's teachers, without this background in education, would be more forthcoming in their responses, not feeling internal pressure to respond in a certain way.

Sample Size

The Cognitive Interest Inventory, developed by this researcher, was given to the entire population of ACSC students and those faculty who actually taught the three courses involved in this study. The responses from the 214 students not in the United States Air Force were recorded and saved for possible future research. Only the United States Air Force officers' responses were included in this study. The support of the leadership of the school and their interest in this research, combined with the fact that this is a military school, led this researcher to anticipate a high response rate.

Procedures for Protection of Human Subjects

All potential respondents were informed that the data was being used for a dissertation and were assured that their responses would never be matched to their names. Complete anonymity was promised and delivered. This researcher had two rosters of all potential respondents. The first roster with subject numbers and names was used to record student grades and ensure each student received the inventory with the correct subject number. The second roster had subject number only and was used to record responses to the inventory with the grades already entered for each student. The roster with the names was destroyed by this researcher before the inventory was distributed. A means for each interested respondent to request a copy of the results of this study was also provided. These procedures for the protection of human subjects were reviewed by Auburn University's Institutional Review Board and approved for use in this study. A copy of this approval can be found in Appendix D.

Instrument Design

The primary focus of this study was to determine whether there was a significant difference in performance on the end of course written examinations between students with the same cognitive interest as their teacher and students with a different cognitive interest than their teacher. To accomplish this, an instrument was needed that enabled the researcher to categorize each student and each teacher into his/her predominant cognitive interest: technical, practical, or emancipatory.

A review of the literature on instrument design (e. g., Salant & Dillman, 1994; Czaja & Blair, 1996; and Ary, et al., 1996) revealed the major concern of this type of research to be low response rates. Having confidence that this would not be a problem with this study, this researcher could concentrate on minimizing other potential problems and maximizing the effectiveness of the instrument. The number of questions was kept to the absolute minimum necessary to obtain the required data. Ary, et al., have suggested that the researcher “keep the questionnaire as brief as possible so that it requires a minimum of the respondents time” (p. 447).

A Likert-type scale was used to facilitate the assignment of numerical values to the responses. The responses included strongly disagree, disagree, neutral, agree, and strongly agree. Numerical values were awarded to each response using 1, 2, 3, 4, and 5, respectively. In its original form, the inventory contained fifteen items for each of the three cognitive interests, for a total of 45 items. The items were developed based on extensive research of Habermas and his knowledge-constitutive interests. They were designed in such a way that the subjects’ responses indicated their dominant cognitive interest, either technical, practical, or emancipatory.

Upon completion, each inventory was scored by this researcher. Each response was assigned a numerical value as described in the previous paragraph and the scores for all items representing each cognitive interest were added together. The three totals were

then divided by the number of items representing each interest producing three cognitive interest means for each respondent. The highest mean indicated the predominant cognitive interest for each respondent. In this study, no consideration was given to the magnitude of the differences between the means, only which was the highest. If two or more means for any respondent were identical, the respondent was classified as “undetermined” for the purpose of this study.

Content Validity

During construction of the inventory, the focus was on developing a valid and reliable instrument. An important aspect of this process was content validity. Ary, et al., (1996) define content validity as “the degree to which the items on an instrument representatively sample the underlying content domain” (p. 565). To enhance content validity, a jury of knowledgeable individuals was asked to provide expert opinion. Five educators who have studied Habermas extensively, written books and journal articles about Habermas, and were familiar with the purpose of this study were asked to examine the items to determine whether they were appropriate for measuring what they were designed to measure. Letters, electronic mail messages, and telephone calls were used in an attempt to contact each of these five potential jurors. One potential juror did not respond to any inquiries and another replied that he was too busy to assist in this study. The three remaining jurors agreed to review the instrument and make suggestions to enhance its validity. A list of potential jurors and those who participated in this study can be found at Appendix E.

The original version of the inventory including instructions for completion was forwarded to each of the three jurors. They were asked to not only view each item for content validity but also to ensure that each item represented the cognitive interest that it was intended to represent. Each of the jurors provided feedback on ways to improve

several of the items. Detailed results of this jury validation procedure are reported in Chapter IV and discussed in Chapter V.

The Cognitive Interest Inventory was revised to incorporate all changes suggested by the jurors. After this revision, the 45 items were reordered to obtain a random order of items. This researcher used a standard deck of playing cards to accomplish the random order. After shuffling the deck five times, the cards were turned over one at a time. As each of the kings was turned over, it was removed and the suit was recorded to establish an order of suits. This draw ordered the suits as follows: hearts, spades, diamonds, and clubs. Three of the queens were also removed, leaving 45 cards. Based on the order of kings, ace through jack of hearts represented items 1 through 11, ace through jack of spades represented items 12 through 22, ace through jack of diamonds represented items 23 through 33, ace through jack of clubs represented items 34 through 44, and the remaining queen represented item 45. The deck was reshuffled and the cards turned over one at a time to reorder the inventory items. For example, the first card was the 10 of clubs, so item 43 became the new item 1. The complete revised order of items and the cognitive interest each was designed to represent are listed in Appendix F.

The revised inventory was then presented to two ACSC teachers who were scheduled to leave before the actual data collection phase of the study would take place. After each completed the inventory, this researcher sat down with them, individually, and explained the purpose of the inventory. Each was also shown into which category his responses to the inventory had placed him. After describing the essence of each of the three cognitive interests, both agreed that their score on the instrument had placed them in the appropriate category. Both participants told this researcher that none of the items was confusing or unclear to them. The instrument was ready for one final validity check.

As a final check of content validity, the instrument was presented to a graduate class at Auburn University. The students were in EDL 635, Curriculum and Instruction

Application, the fifth in a series of five curriculum and instruction courses. They had read Grundy (1987), cited by many (e. g., Li and Reigeluth, 1995) as the clearest analysis of Habermas' theory as it applies to education. In addition, they had discussed Habermas and his theory in various contexts for four quarters. They were given the instrument and asked to complete it just as the actual participants would. This researcher answered all questions that arose during their completion of the inventory. After everyone had completed the inventory, each was given another copy and asked to label each item as either technical, practical, or emancipatory as a final validity check. Results of this field-testing procedure are presented in Chapter IV and discussed in Chapter V. Each of these graduate students was also asked to complete Zinn's Philosophy of Adult Education Inventory, which is described in detail later in this chapter.

Construct Validity

In addition to content validity, construct validity was also important to the validity of this instrument. Ary, et al. (1996) define construct validity as "the degree to which an instrument measures the traits or characteristics implied by the construct it is intended to measure" (p. 565). They also list factor analysis as a commonly used method for gathering evidence of construct validity (pp. 270-271). This procedure (factor analysis) was chosen by this researcher to determine the extent to which individual items on the inventory contributed to the three different scales. Each of the three scales was assumed to represent one of the three cognitive interests, technical, practical, or emancipatory.

The specific procedure this researcher accomplished was a confirmatory factor analysis which required hypothesizing the number of factors present in the inventory (Kim & Mueller, 1978, p. 55). Based on design by this researcher and validation by the jurors, it was hypothesized that three factors were present in the inventory. As part of the confirmatory factor analysis (Kotz & Johnson, 1983), it was also postulated by this researcher that the pattern of zero and nonzero loadings would confirm that the 15 items

designed to represent each scale truly did represent the cognitive interest for which they were designed. Finally, a test of significance was performed to determine whether or not the postulated factor content was confirmed.

The same subjects used for investigation of the hypotheses in this study were used to accomplish the factor analysis. Ary, et al., (1996) explained validity by stating, "a scale should be constructed with only a single purpose in mind" (p. 273). They added that the researcher must know the purpose, the setting, and the population in which it will be used to accurately assess the instrument's validity for this single purpose. The best way to accomplish this was to use the actual research subjects to test the validity of the instrument.

With this in mind, the Cognitive Interest Inventory was given to the students of the ACSC class of 1997 between March 13, and March 17, 1997. The distribution of the inventory was preceded by a personal letter to each student advising them that the inventory was coming, its purpose, and thanking them in advance for their participation. A copy of this advance-notice letter for students can be found in Appendix G. The inventory was personally delivered to each seminar by this researcher and instructions for its completion were explained. Salant and Dillman (1994) referred to this technique as a drop-off survey. This method combines the low cost and convenience of mail surveys with the personal touch of face-to-face interviews. It was assumed that "putting a face" on the inventory would encourage the respondents to complete them in a timely manner and increase response rate. Three central collection points were provided for the convenience of the respondents and an electronic mail address and telephone number were provided to each student, in case they had questions. The inventory was given to all teachers at once, during a Dean's call on March 26. Each teacher was also given a personal advance-notice letter very similar to the one distributed to the students that was described earlier in this paragraph. A copy of this advance-notice letter for teachers can

be found in Appendix H. This researcher was available to answer any questions the teachers had as they completed the inventory.

The inventories distributed to the students were endorsed by the Commandant of ACSC, Colonel Drennan. A copy of this endorsement can be found in Appendix I. The inventories distributed to the teachers were endorsed by the Dean of Education and Curriculum, Colonel Dickson. A copy of this endorsement can be found in Appendix J. All inventories used in this study (476 students and 75 teachers responded) were returned to this researcher by April 1.

The factor analysis was accomplished statistically, using the Factor application of the Statistical Package for the Social Sciences (SPSS). The responses to each of the 45 items for all respondents ($n = 551$) were loaded into the computer program. All 45 variables were analyzed in relation to all three scales to determine the extent to which each variable contributed to each scale and to identify common factors underlying the instrument as a whole. In order to facilitate interpretation of the factor analysis data, the maximum likelihood factors were extracted using the Varimax rotation option of SPSS Factor Analysis. Varimax rotation was selected by this researcher to simplify the interpretation of the factors. The Rotated Factor Matrix and Factor Score Coefficient Matrix were analyzed to determine which items loaded on which factors. Results of the factor analysis are reported in Chapter IV and discussed in Chapter V.

Concurrent Validity

The degree to which scores on an instrument are related to other indicators of the same criterion when collected at the same time is referred to as concurrent validity (Ary, et al., 1996, p. 566). Lorraine M. Zinn, Ph.D., granted this researcher permission (A copy of the permission letter is in Appendix K) to use her Philosophy of Adult Education Inventory® (PAEI) in support of this study. A copy of the PAEI can be found in Appendix L. This inventory was given to each of the 92 teachers in addition to the

Cognitive Interest Inventory to evaluate concurrent validity. It was assumed that using an established instrument with proven reliability and validity would enhance the credibility of this study.

An additional factor linking this researcher's Cognitive Interest Inventory with Zinn's PAEI was found in the work of Evan T. Robinson. Robinson (1997) validated Zinn's instrument to Habermas by labeling the Five Philosophies of Adult Education into cognitive interest categories as follows: Liberal = Practical/Emancipatory, Behavioral = Technical, Progressive = Emancipatory/Practical, Humanistic = Technical/Practical, and Radical = Emancipatory. (See Appendix M for a copy of this revised portion of the PAEI.) The teachers involved in this study were categorized by their responses to the PAEI using Robinson's headings. If the Cognitive Interest Inventory developed by this researcher had concurrent validity, the teachers' responses to both inventories should have placed them into matching categories. SPSS was used to compute the correlation coefficient between the two inventories. Dr. Zinn reviewed a draft copy of the Cognitive Interest Inventory and approved of the way her PAEI was used in this study. Results of the correlation between the two instruments are reported in Chapter IV and discussed in Chapter V.

Finally, another important variable that influences validity is anonymity of the respondents. As Ary, et al., (1996) pointed out, "It is reasonable to assume that greater truthfulness will be obtained if the respondents can remain anonymous" (p. 462). In this study, anonymity was promised and delivered to all respondents. A valid instrument must also be reliable to be effective. The measures taken to test reliability of the Cognitive Interest Inventory are discussed in the following paragraph.

Reliability Testing

Any test of reliability measures one of two important concepts. First, it measures the extent to which an instrument yields consistent results. Second, it measures the

extent to which scores are free of random error (Ary, et al., 1996, p. 574). Ary, et al., listed three possible reliability coefficients for one instrument, measuring one trait, that is administered only one time. These three reliability tests are split-half, Kuder-Richardson (K-R) 20, and coefficient alpha (p. 284). Since K-R 20 is used for instruments when items are scored dichotomously, only split-half and coefficient alpha, a test of reliability especially useful for attitude scales, measures of reliability were computed to test the reliability of the Cognitive Interest Inventory.

The same data used for the factor analysis, described above, was used for these reliability tests with one exception. Items that loaded on the wrong factor or cross-loaded between factors were removed from the data before the reliability tests were performed. By removing these items, only those items included in the analysis of the data to answer the research questions of this study were included in the reliability testing. The SPSS "Reliability" program was used to compute the alpha coefficient and split-half reliability of the Cognitive Interest Inventory. Results of the alpha coefficient and split-half reliability tests are reported in Chapter IV and discussed in Chapter V. Based on the data, this researcher was confident that the Cognitive Interest Inventory was a valid and reliable instrument and could be used to investigate the research questions of this study.

Analysis of the Data

Responses to the Cognitive Interest Inventory enabled this researcher to categorize each student and each teacher into one of three cognitive interest groups. They were coded as follows: 1 = technical, 2 = practical, and 3 = emancipatory. These nominal variables served as the independent variable for testing of the second and third hypotheses. An additional variable, developed after comparing the cognitive interest category of each student with the cognitive interest category of his/her teacher served as the independent variable for testing of the first hypothesis. This variable was coded as

follows: 1 = student and teacher have the same predominant cognitive interest, and 2 = student and teacher have a different predominant cognitive interest. The grades for the end of course examinations were obtained from the ACSC evaluation branch. The ACSC Commandant approved their release to this researcher. The grades were recorded using the same number values that ACSC uses: A = 4.0, A minus = 3.5, B = 3.0, B minus = 2.5, C = 2.0, C minus = 1.5, D = 1.0, and F = 0. These interval variables served as the dependent variable for the testing of all three hypotheses.

The data was analyzed for each of the three courses separately. The same procedures were repeated three times, once for each course. Means and standard deviations of all groups for all variables were reported. To test the first hypothesis (Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference between the mean grade of students who have the same cognitive interest as their teacher and the mean grade of students who have a different cognitive interest than their teacher on the end of course written examinations.), the students were placed into two groups, those who had the same cognitive interest as their teacher and those who did not. Using the SPSS "Compare Means" program, a "t-test" was used to test the significance of the difference between the two means.

To test the second hypothesis (Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the three student groups [technical, practical, and emancipatory] on the end of course written examinations.), the students were placed into one of three groups based on their predominant cognitive interest. Using SPSS, a one-way analysis of variance (ANOVA) was used to test the difference among the three means. The cognitive interest of the teacher was ignored during testing of this hypothesis.

To test the third hypothesis (Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the students on the end of course written examinations based on the cognitive interest of their teacher.), the students were placed into one of three groups based on the cognitive interest of their teacher. Using SPSS, a one-way ANOVA was used to test the difference among the three means. The cognitive interest of the student was ignored during testing of this hypothesis. The level of significance used throughout this study was .05. Results of the three “t-tests” and the six ANOVAs are reported in Chapter IV and discussed in Chapter V. The following chapter reports the findings of all aspects of this study and the final chapter discusses each finding in detail.

IV RESULTS

In the previous chapter, the methodology used to conduct this research was explained in detail. The first phase of this study was a thorough review of the literature on Habermas, his theory of cognitive interests, and the importance of recognizing each learner as an individual. The results of this literature review were reported in Chapter II. This chapter details the results of the second and third phases of this research study. First, findings from the research that addressed two assumptions made by this researcher are reported to help set the foundation for this study. Development of a valid and reliable instrument to investigate the research questions of this study was the second phase of this research. Results of the steps taken to validate the Cognitive Interest Inventory and the procedures used to check its reliability are reported next. Finally, the results of the investigation of the hypotheses examined in this research study are reported and discussed.

The literature on adult education (e. g., Galbraith, 1990) revealed that many adult educators, while experts in the content they teach, lack the preparation to actually guide adults through the learning process. Based on familiarity with the faculty of ACSC, this researcher made the assumption that the teachers of this school were similar to most adult education teachers in this respect. The responses supplied by the teachers involved in this study to two items on the “demographic information” page of the Cognitive Interest Inventory provided evidence to assess the validity of this assumption. To address this assumption, the teachers were asked to complete the following items:

My undergraduate degree is in _____.

Before joining the faculty of ACSC, I had _____ years of teaching experience.

Results of the teachers' responses to these two items are summarized in Tables 1 and 2.

Table 1

Educational Background of Teachers

| <u>Undergraduate Degree</u> | <u>Number of Teachers</u> |
|-------------------------------------|---------------------------|
| Social Sciences | 18 |
| Engineering | 18 |
| Business, Economics, and Management | 17 |
| Others | 8 |
| Sciences | 6 |
| Education | 4 |
| None | 1 |
| TOTAL | 72 |

Note. Only 72 teachers completed this item on the inventory.

According to the information summarized in Tables 1 and 2, the assumption made by this researcher about the background and experience of the teachers involved in this study appears to be a valid one. According to the data summarized in Table 1, only 4 teachers (5.5 %), of the 72 who responded, majored in education. When combined with the data in Table 2 that shows 49 (68.1 %) teachers had 3 years or less teaching experience and 26 (36.1 %) had no prior teaching experience, it appears that this group of teachers is similar to the group Knox (cited in Galbraith, 1990) termed "most instructors in adult education programs" (p. 4).

Table 2

Teaching Experience

| Years Teaching | Number of Teachers |
|-----------------------|---------------------------|
| Over 10 | 3 |
| 9 | 0 |
| 8 | 3 |
| 7 | 3 |
| 6 | 6 |
| 5 | 2 |
| 4 | 7 |
| 3 | 12 |
| 2 | 7 |
| 1 | 4 |
| 0 | 26 |
| TOTAL | 73 |

Note. Only 73 teachers completed this item on the inventory.

Whereas the teachers involved in this study appear to be similar to most groups teaching in adult education settings, the assumption was made by this researcher that the students involved in this study were not. A perceived limitation of this study was the potential restricted range of grades due to the high quality of students involved. Table 3 shows the distribution of grades on the final examinations for the three courses investigated by this study.

Table 3

Examination Grades

| Grade | Number of Students in each Course | | |
|--------------|--|-------------------|------------------------------|
| | War and Conflict | War Theory | Strategic Environment |
| A | 99 | 72 | 75 |
| A- | 126 | 131 | 123 |
| B | 273 | 301 | 262 |
| B- | 85 | 71 | 104 |
| C | 12 | 20 | 32 |
| C- | 5 | 4 | 3 |
| D | 0 | 0 | 2 |
| F | 0 | 2 | 0 |
| TOTAL | 600 | 601 | 601 |

As illustrated in Table 3, the majority of students at ACSC earned grades in the A to B range. In the three courses investigated by this study, the number of students earning one of the top three grades (A, A minus, or B) was 498 (83 %), 504 (83.9 %), and 460 (76.5 %) respectively. This distribution of grades appears to confirm the concerns this researcher had about restricted range as a possible limitation of this study. There is also the possibility that the large number of students who earned the grades of A minus or B, 399 (66.5 %), 432 (71.9 %), and 385 (64.1 %), could affect the investigation of the hypotheses in this study due to a lack of variability in the dependent variables. With this increased understanding of the teachers and students involved in this study, and the potential impact on the dependent variable, the instrument used to determine the independent variables is reviewed next.

Instrument Validation

A major portion of this study was the development of the Cognitive Interest Inventory, an inventory designed to enable the user to categorize each respondent into his/her predominant cognitive interest (technical, practical, or emancipatory). For a research study to have any measure of significance to the related field, the instrument used to collect the data must be both valid and reliable. The procedures used to ensure the validity of the instrument used in this study are discussed first.

Content Validity

Content validity was primarily established by a jury of individuals identified as knowledgeable about Habermas' theory of cognitive interests and the intended use of the instrument (see Appendix E for a list of jurors). The three jurors who agreed to lend their expertise to this study each provided several suggestions to improve the inventory, both in its presentation and content.

Based on suggestions from the jurors, several structural changes were made to the inventory to increase its readability and ease of completion. First, the numbers used in the original draft (1, 2, 3, 4, and 5) as possible responses were changed to SD, D, N, A, and SA to more accurately represent the actual responses. One juror commented that, in his experience, respondents have a tendency to favor high numbers and recommended this change to attain more accurate results. The second structural change was to change the letters of each item from all upper case to normal sentence structure for ease of reading by the respondents. Finally, the possible responses were realigned so the letters were under the word they represented on the top of each page. For example, the A response for each item was placed directly under the word AGREE. The instructions for completing the inventory were also changed accordingly to reflect these changes.

In addition to these cosmetic changes, each of the jurors also provided several suggestions to improve the content of the inventory. Ten items were completely

rewritten to better express the intent of the particular cognitive interest for which they were designed. In addition, 21 items had minor changes (two words or fewer) in wording to enable each to more clearly depict the appropriate cognitive interest. Finally, 14 items were unchanged as none of the jurors found a need for revision of these items. The original draft inventory, as it was presented to the jurors, and a list of the items that were changed can be found in Appendix N. Most importantly, each of the jurors expressed confidence that each item, as modified, did represent the cognitive interest it was intended to represent.

After all changes to the inventory, recommended by the jurors, were made the items were randomly assigned new item numbers. The method used to assign the new numbers was detailed in Chapter III. The revised order of items and the cognitive interest each was designed to represent are listed in Appendix F.

Initially, this researcher was concerned about four consecutive items representing the same cognitive interest (items 15 - 18), but was assured by an experienced statistician that this was acceptable as long as the items were randomly ordered. The revised inventory was then presented to two teachers at ACSC who would be actual participants in this study. The responses of these two teachers indicated that both had the “practical” cognitive interest as their predominant interest. Post-inventory conversations with both instructors revealed that both agreed with their placement into the “practical” interest after the main points of each cognitive interest were explained to them.

One final check of content validity was performed by field testing the Cognitive Interest Inventory. This field test of the inventory was performed in a graduate class at Auburn University. A description of the class and their experience with Habermas was discussed in Chapter III. The results of this field test follow.

All respondents considered the instructions for completing the inventory clear and commented that none of the items was confusing or hard to understand. Based on their

understanding of Habermas, there was unanimous agreement that the inventory was a valid instrument for evaluating the cognitive interests of potential respondents. Each was also in agreement with the cognitive interest category into which their responses had placed them. Comments such as, “accurately reflects my beliefs,” and “that’s me, all right,” were common throughout the post-inventory conversation. As an additional check of content validity, these graduate students were presented with another copy of the inventory and asked to label each item as either technical, practical, or emancipatory.

This final check showed that 80 % of the items were placed into the correct cognitive interest by at least half of the participants, over half (53.3 %) were correctly identified by at least four of the six participants, nearly one-fourth (24.4 %) were correctly labeled by at least five of the six participants, and four items (8.8 %) were placed into the correct category by all six participants. The results of this field test with a group of students who possessed a working knowledge of Habermas’ theory, combined with the belief in the content of the instrument expressed by each of the jurors who were acknowledged experts, indicated to this researcher that the Cognitive Interest Inventory possessed sufficient content validity to be considered a valid instrument.

Construct Validity

Construct validity of the Cognitive Interest Inventory was verified through a confirmatory factor analysis, using the Factor Analysis program found in the Statistical Package for the Social Sciences (SPSS). In this study, the construct measured was the cognitive interest of each student and teacher involved in the study.

Response Rate. The total response rate for the construct validity test was 80.1 % (551 of 688). Even though only the United States Air Force students’ responses were used to answer the research questions examined by this study, for validation of the instrument all student responses were used. The response rate for students was 79.2 % (476 of 601) and the response rate for teachers was 86.2 % (75 of 87). The discussion of

the methodology in Chapter III indicated that the total number of teachers of the three courses considered by this study was 92 (31 + 30 + 31). It was discovered during preparation of the inventory for distribution however, that three teachers had actually taught two of the courses reducing the actual number of teachers investigated to 89. In addition, two other teachers were unavailable to participate in this study. One was on extended emergency leave due to a serious illness in the family and the other had departed to another assignment and this researcher was unable to obtain a current address. Thus, the total number of teachers available for this study was 87 and the total number of participants was 688. During conversations with Majors Couch and Thomas of the Evaluation Office at ACSC, it was discovered that the normal response rate for surveys at the school was approximately 40 %. Based on this fact, this researcher was satisfied with an overall response rate over 80 %.

Results. The rotated factor matrix, reported in Tables 4 - 6, indicated that Factor 1 represented the emancipatory interest, Factor 2 the technical interest, and Factor 3 the practical interest. Each of the 15 items designed to represent the emancipatory interest loaded significantly ($>.30$) on Factor 1, but two items (16 and 30) had higher loadings on Factor 3. All 15 items designed to represent the technical interest loaded significantly on Factor 2. In contrast, of the 15 items designed to represent the practical interest, only 12 loaded significantly on Factor 3 and one of those (43) loaded higher on Factor 2. Items 5, 22, and 35, designed to represent the practical interest, did not load significantly on Factor 3. The “Test of fit of the 3-factor model” computed by SPSS revealed a Chi-square statistic of 1699.3625 with a df of 858. This produced a significance level of .0000, indicating that the postulated factor content was confirmed statistically.

The Factor Score Coefficient Matrix (see Appendix O) was also analyzed for all 45 items. This matrix showed the coefficients by which variables were multiplied to obtain factor scores. Based on these scores and the factor loadings obtained through the

rotated factor matrix, six items (5, 16, 22, 30, 35, and 43) were eliminated from the study because they either loaded on the wrong factor or cross-loaded between two or more factors.

Table 4

Rotated Factor Matrix for the Technical Scale

| Item | Factors | | |
|-------------|----------------|------------|------------|
| | 1 | 2 | 3 |
| 1 | .09 | .36 | .24 |
| 3 | -.08 | .47 | .12 |
| 4 | .29 | .51 | -.01 |
| 7 | .12 | .55 | -.04 |
| 8 | .15 | .49 | -.04 |
| 11 | -.08 | .53 | .37 |
| 12 | .17 | .57 | .17 |
| 14 | .11 | .51 | -.08 |
| 19 | -.08 | .62 | .25 |
| 26 | .12 | .59 | -.05 |
| 32 | -.17 | .45 | .28 |
| 36 | -.00 | .52 | .10 |
| 39 | .26 | .54 | -.24 |
| 42 | .26 | .44 | .06 |
| 44 | .18 | .46 | .11 |

Note. Varimax rotation with Kaiser normalization

Significant factor loadings (>.30) in **bold type**

+ and - coefficients are equally significant

Table 5

Rotated Factor Matrix for the Practical Scale

| <u>Item</u> | <u>Factors</u> | | |
|-------------|----------------|------------|------------|
| | <u>1</u> | <u>2</u> | <u>3</u> |
| 2 | .03 | .18 | .35 |
| 5 | .49 | .30 | .09 |
| 13 | .29 | .22 | .38 |
| 20 | .19 | -.06 | .55 |
| 21 | -.01 | .03 | .69 |
| 22 | .43 | .16 | .30 |
| 25 | .12 | .23 | .31 |
| 28 | .20 | .26 | .42 |
| 29 | .21 | .25 | .42 |
| 34 | .28 | .10 | .42 |
| 35 | .15 | .30 | .13 |
| 37 | .11 | .19 | .50 |
| 40 | .28 | .04 | .59 |
| 41 | .10 | .01 | .44 |
| 43 | .25 | .40 | .35 |

Note. Varimax rotation with Kaiser normalization

Significant factor loadings (>.30) in **bold type**

+ and - coefficients are equally significant

Table 6

Rotated Factor Matrix for the Emancipatory Scale

| <u>Item</u> | <u>Factors</u> | | |
|-------------|----------------|----------|------------|
| | <u>1</u> | <u>2</u> | <u>3</u> |
| 6 | .37 | .18 | .10 |
| 9 | .46 | -.13 | .34 |
| 10 | .46 | -.00 | .38 |
| 15 | .33 | .14 | .30 |
| 16 | .37 | -.09 | .41 |
| 17 | .45 | .08 | .39 |
| 18 | .56 | .10 | .25 |
| 23 | .68 | .20 | .10 |
| 24 | .64 | .15 | .08 |
| 27 | .62 | .13 | .01 |
| 30 | .33 | -.14 | .50 |
| 31 | .61 | .15 | .12 |
| 33 | .44 | -.15 | .35 |
| 38 | .46 | .15 | .14 |
| 45 | .61 | .08 | .23 |

Note. Varimax rotation with Kaiser normalization

Significant factor loadings (>.30) in **bold type**

+ and - coefficients are equally significant

Only the remaining 39 items were used to compute the reliability of the instrument and analyze the data required to address the hypotheses of this study. With the 15 technical interest items, 11 practical interest items, and 13 emancipatory interest

items remaining, the factor analysis appeared to confirm that the Cognitive Interest Inventory contained sufficient construct validity to be considered a valid instrument.

Concurrent Validity

Concurrent validity was analyzed using the responses of the 75 teachers who participated in this study. The cognitive interest category into which each teacher was placed as a result of his/her responses to the Cognitive Interest Inventory, was compared to the category that his/her responses to Zinn's (1994) Philosophy of Adult Education Inventory (PAEI) placed him/her into, using the revised headings developed by Robinson (1997). Each of the 150 instruments (75 Cognitive Interest Inventories and 75 PAEIs) was completed correctly by the respondents and each was hand-scored by this researcher three separate times to ensure no errors in scoring. As a result, each of the 75 respondents provided two useful inventories.

Results. During the field test, discussed in Chapter III and the Content Validity section of this chapter, five of the six (83.3 %) respondents were placed into matching categories as a result of their responses to both instruments. The correlation coefficient between the two instruments, computed using the Correlation subprogram of SPSS, was .9615 with a p value of .002. Based on the statistically significant correlation between the two instruments using this small sample, this researcher decided to repeat this procedure to test the concurrent validity with the larger population involved in this study.

For the teachers who participated in this study, 55 out of 75 (73.3 %) were placed into matching categories by their responses to the Cognitive Interest Inventory and the PAEI. The correlation coefficient between the two instruments, computed using the Correlation subprogram of SPSS, was .2784, with a p value of .016. This indicated that the correlation between the two instruments was statistically significant. The statistical significance of the correlation between the two instruments indicated that the Cognitive Interest Inventory was measuring the same construct as Zinn's PAEI, an established

instrument with proven validity. It appeared that, in this study, the Cognitive Interest Inventory did possess sufficient concurrent validity to be considered a valid instrument.

Content validity verified by a jury of experts knowledgeable about Habermas and his theory, construct validity confirmed by factor analysis, and concurrent validity with a valid instrument that has been in the field for 14 years indicated to this researcher that the Cognitive Interest Inventory was a valid instrument for measuring the cognitive interests of students and teachers. In addition to this validity, the reliability of the instrument was also important. The results of the procedures used to measure the reliability of the Cognitive Interest Inventory are reported next.

Reliability Testing

Data for reliability testing was identical to the data used for the factor analysis described earlier in this chapter with one exception. The responses to the six items that were removed from the instrument as a result of the factor analysis were not considered in reliability testing.

Response Rate

The response rate for the reliability test was the same as the factor analysis used to measure the construct validity of the instrument (80.1 %). As with the validity test, the responses of all 551 respondents were included in the reliability testing even though only the United States Air Force students were actually included in the analysis of the data to answer the research questions investigated in this study. All 551 Cognitive Interest Inventories that were returned were individually hand-scored, three times each, by this researcher to ensure that no scoring errors were present in the data. In addition, all returned inventories except two provided usable data. Two inventories completed in such a way that the responses were unusable for this study were considered as non-responses and not included in the response rate percentages reported earlier in this chapter.

Alpha Coefficients

The first measure of reliability used in this study was the alpha coefficient (also referred to as Cronbach alpha) test of internal consistency. This coefficient measured the extent to which the scores of the individual items agreed with one another and provided a score that represented the maximum likelihood estimate of reliability. A standardized item alpha was also calculated by dividing the observations on each item by the standard deviation of the item (Zinn, 1983, p. 122). Both alpha coefficients and standardized item alpha coefficients were calculated for each of the three scales (technical, practical, and emancipatory), using the SPSS Reliability Analysis subprogram. The results of this reliability analysis are reported in Table 7.

Table 7

Alpha Coefficients and Standardized Item Alphas

| <u>Scale</u> | <u>Alpha Coefficient</u> | <u>Standardized Item Alpha</u> |
|-----------------------|--------------------------|--------------------------------|
| Technical interest | .8187 | .8195 |
| Practical interest | .7538 | .7591 |
| Emancipatory interest | .8358 | .8373 |

Split-half Reliability

While the alpha coefficients measured the reliability of the three scales individually, another measure of internal consistency that measured the instrument as a whole was split-half reliability. The split-half reliability subprogram found in SPSS provided this researcher with two important reliability coefficients by artificially dividing the instrument into two halves and comparing the individuals' responses on the two halves of the instrument.

The first coefficient of importance was an unequal-length Spearman-Brown coefficient of .8193. The second important coefficient computed by SPSS was the alpha coefficient for each half of the instrument. The reliability analysis of the two halves of the Cognitive Interest Inventory provided an alpha for part 1 of .8108 and an alpha for part 2 of .8098.

The results of the alpha coefficient calculations indicated each of the three scales (technical interest, practical interest, and emancipatory interest) present in the instrument used in this study contained a high degree of internal consistency. In addition, the results of the split-half reliability analysis indicated that the instrument, as a whole, contained a high degree of internal consistency. Based on these two measures of reliability, it appeared that the Cognitive Interest Inventory was a reliable instrument for measuring the cognitive interests of students and teachers in an adult education setting. As a result of the indicated validity and reliability of the instrument, this researcher used the Cognitive Interest Inventory to investigate the hypotheses of this research study.

Investigation of the Hypotheses

Using the Cognitive Interest Inventory, each United States Air Force student ($n = 319$) that responded and each teacher of the three courses investigated in this study ($n = 75$) that responded was placed into one of three cognitive interest categories. Based on his/her responses to the 39 valid items on the inventory, each was classified as having the predominant cognitive interest of either technical, practical, or emancipatory. The number of students and teachers in each cognitive interest group are reported in Table 8.

Response Rate

The response rate for the teachers involved in this study is identical to the response rate for the validity and reliability measures reported earlier in this chapter (86.2 %). The response rate for the United States Air Force students was 82.4 % (319 of 387). This was slightly higher than the overall student response rate of 79.2 %.

Table 8

Cognitive Interest of Students and Teachers

| <u>Respondents</u> | <u>Technical</u> | <u>Practical</u> | <u>Emancipatory</u> |
|--------------------------------|-------------------------|-------------------------|----------------------------|
| Students | 64 | 242 | 13 |
| War and Conflict Teachers | 4 | 18 | 2 |
| War Theory Teachers | 2 | 24 | 0 |
| Strategic Environment Teachers | 0 | 25 | 2 |

Note. The total number of teachers depicted in this table is 77 because two teachers each taught two of the courses.

Independent Variables

The cognitive interest of each student, summarized in Table 8, served as the independent variable for the investigation of the second hypothesis examined in this study. The cognitive interest of each teacher, also summarized in Table 8, served as the independent variable for the investigation of the third hypothesis examined in this study. To obtain the independent variable for the first hypothesis, the cognitive interest of each student was compared to the cognitive interest of his/her teacher to determine whether or not there was a cognitive interest match for each student. The number of student-teacher cognitive interest matches and mismatches is reported in Table 9.

The 75 teachers who responded to this study represented the three courses as follows: War and Conflict - 24 teachers, War Theory - 26 teachers, and Strategic Environment - 25 teachers. When students' and teachers' cognitive interests were compared, only the cases in which both the student and his/her teacher responded appeared in the data. The results are the numbers found in Table 9.

Table 9

Cognitive Interest Matches and Mismatches

| <u>Course</u> | <u>Matches</u> | <u>Mismatches</u> | <u>Total</u> |
|-----------------------|----------------|-------------------|--------------|
| War and Conflict | 164 | 84 | 248 |
| War Theory | 210 | 76 | 286 |
| Strategic Environment | 212 | 77 | 289 |

Dependent Variable

The dependent variable for the investigation of all three hypotheses examined in this study were the students' grades on the end of course examination for each of the three courses. The grades of all ACSC students were discussed earlier in this chapter to provide background information for this study. The grades for each course of the 319 students who participated in this research are reported in Table 10.

Table 10

Participating Students' Grades

| <u>Grade</u> | <u>War and Conflict</u> | <u>War Theory</u> | <u>Strategic Environment</u> |
|--------------|-------------------------|-------------------|------------------------------|
| A | 72 | 52 | 50 |
| A- | 77 | 89 | 74 |
| B | 127 | 140 | 135 |
| B- | 35 | 27 | 45 |
| C | 5 | 10 | 12 |
| C- | 3 | 1 | 2 |
| D | 0 | 0 | 1 |
| TOTAL | 319 | 319 | 319 |

The predominant cognitive interest of 319 students and 75 teachers, the cognitive interest matches and mismatches between students and teachers, and the students' grades on the end of course examinations served as the variables necessary to investigate the hypotheses examined in this study.

Hypothesis Number 1

Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference between the mean grade of students who have the same cognitive interest as their teacher and the mean grade of students who have a different cognitive interest than their teacher on the end of course written examinations.

To test this hypothesis, the 248 War and Conflict students, 286 War Theory students, and 289 Strategic Environment students who responded to this study and had a teacher who responded were placed into one of two groups. The first group (Match) contained those students who had the same cognitive interest as their teacher. The second group (Mismatch) contained those students who had a different cognitive interest than their teacher. Using the SPSS Compare Means subprogram, an "independent sample t-test" was used to compute the difference between the two means. The same procedures were repeated for each of the three courses.

War and Conflict. The 24 War and Conflict teachers who responded to this study, combined with the 319 students who responded, provided 248 possible cognitive interest matches. The results of the t-test for the War and Conflict course are reported in Table 11.

Conclusion. Within the context of the War and Conflict course at ACSC, the mean grade of students who had the same cognitive interest as their teacher was significantly higher than the mean grade of students who had a different cognitive interest than their teacher on the end of course written examinations.

Table 11

T-test for the War and Conflict Course

| <u>Variable</u> | <u>n</u> | <u>Mean</u> | <u>SD</u> |
|-----------------|----------|-------------|-----------|
| Match | 164 | 3.3232 | .519 |
| Mismatch | 84 | 3.1905 | .565 |

Mean Difference = .1327

Levene's Test for Equality of Variances: $F = .000$ $P = .988$

t-test for Equality of Means

| <u>t-value</u> | <u>df</u> | <u>2-Tail Sig</u> | <u>SE of Diff</u> |
|----------------|-----------|-------------------|-------------------|
| 1.85 | 246 | .066 | .072 |

Note. The t-value is significant at the .05 level for a directional (one-tailed) test.

War Theory. The 26 War Theory teachers who responded to this study, combined with the 319 students who responded, provided 286 possible cognitive interest matches. The results of the t-test for the War Theory course are reported in Table 12.

Table 12

T-test for the War Theory Course

| <u>Variable</u> | <u>n</u> | <u>Mean</u> | <u>SD</u> |
|-----------------|----------|-------------|-----------|
| Match | 210 | 3.2262 | .496 |
| Mismatch | 76 | 3.1776 | .488 |

Mean Difference = .0486

Levene's Test for Equality of Variances: $F = .038$ $P = .846$

t-test for Equality of Means

| <u>t-value</u> | <u>df</u> | <u>2-Tail</u> | <u>SE of Diff</u> |
|----------------|-----------|---------------|-------------------|
| .73 | 284 | .464 | .066 |

Conclusion. Within the context of the War Theory course at ACSC, there was no significant difference between the mean grade of students who had the same cognitive interest as their teacher and the mean grade of students who had a different cognitive interest than their teacher on the end of course written examination.

Strategic Environment. The 25 Strategic Environment teachers who responded to this study, combined with the 319 students who responded, provided 289 possible cognitive interest matches. The results of the t-test for the Strategic Environment course are reported in Table 13.

Table 13

T-test for the Strategic Environment Course

| <u>Variable</u> | <u>n</u> | <u>Mean</u> | <u>SD</u> |
|-----------------|----------|-------------|-----------|
| Match | 212 | 3.1745 | .527 |
| Mismatch | 77 | 3.0779 | .591 |

Mean Difference = .0966

Levene's Test for Equality of Variances: $F = .005$ $P = .941$

t-test for Equality of Means

| <u>t-value</u> | <u>df</u> | <u>2-Tail</u> | <u>SE of Diff</u> |
|----------------|-----------|---------------|-------------------|
| 1.33 | 287 | .183 | .072 |

Conclusion. Within the context of the Strategic Environment course at ACSC, there was no significant difference between the mean grade of students who had the same cognitive interest as their teacher and the mean grade of students who had a different cognitive interest than their teacher on the end of course written examination.

Hypothesis Number 2

Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examinations.

To test this hypothesis, the 319 students who responded to this study were placed into one of three groups. The first group (Technical) contained 64 students who had the technical cognitive interest as their predominant cognitive interest. The second group (Practical) contained 242 students who had the practical cognitive interest as their predominant cognitive interest. Finally, the third group (Emancipatory) contained 13 students who had the emancipatory cognitive interest as their predominant cognitive interest. Using the SPSS Compare Means subprogram, a "One-way ANOVA" was used to compute the differences among the three means. The same procedures were repeated for each of the three courses.

War and Conflict. The results of the one-way ANOVA for the War and Conflict course are reported in Table 14.

Conclusion. Within the context of the War and Conflict course at ACSC, there was no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examination.

War Theory. The results of the one-way ANOVA for the War Theory course are reported in Table 15.

Conclusion. Within the context of the War Theory course at ACSC, there was no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examination.

Table 14

Analysis of Variance for the War and Conflict Course

| <u>Group</u> | <u>n</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------|----------|-------------|---------------------------|
| Technical | 64 | 3.1563 | .6034 |
| Practical | 242 | 3.2913 | .5101 |
| Emancipatory | 13 | 3.2308 | .5250 |
| TOTAL | 319 | 3.2618 | .5317 |

Levene's Test for Homogeneity of Variances: $F = .348$ $P = .707$

Analysis of Variance

| <u>Source</u> | <u>df</u> | <u>F Ratio</u> | <u>F Probability</u> |
|----------------|-----------|----------------|----------------------|
| Between Groups | 2 | 1.6633 | .1912 |

Table 15

Analysis of Variance for the War Theory Course

| <u>Group</u> | <u>n</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------|----------|-------------|---------------------------|
| Technical | 64 | 3.1484 | .4853 |
| Practical | 242 | 3.2397 | .4931 |
| Emancipatory | 13 | 3.3077 | .5220 |
| TOTAL | 319 | 3.2241 | .4928 |

Levene's Test for Homogeneity of Variances: $F = .199$ $P = .820$

Analysis of Variance

| <u>Source</u> | <u>df</u> | <u>F Ratio</u> | <u>F Probability</u> |
|----------------|-----------|----------------|----------------------|
| Between Groups | 2 | 1.0626 | .3468 |

Strategic Environment. The results of the one-way ANOVA for the Strategic Environment course are reported in Table 16.

Table 16

Analysis of Variance for the Strategic Environment Course

| Group | n | Mean | Standard Deviation |
|--------------|------------|---------------|---------------------------|
| Technical | 64 | 3.0234 | .6070 |
| Practical | 242 | 3.1860 | .5238 |
| Emancipatory | 13 | 3.0769 | .4494 |
| TOTAL | 319 | 3.1489 | .5413 |

Levene's Test for Homogeneity of Variances: $F = .584$ $P = .558$

Analysis of Variance

| Source | df | F Ratio | F Probability |
|----------------|-----------|----------------|----------------------|
| Between Groups | 2 | 2.4224 | .0904 |

Conclusion. Within the context of the Strategic Environment course at ACSC, there was no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examination.

Hypothesis Number 3

Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the students on the end of course written examinations based on the cognitive interest of their teacher.

To test this hypothesis, the 248 War and Conflict students, 286 War Theory students, and 289 Strategic Environment students who responded to this study and had a teacher who responded were placed into one of three groups. The first group (Technical) contained those students with a teacher that had the technical cognitive interest as his/her predominant cognitive interest. The second group (Practical) contained those students with a teacher that had the practical cognitive interest as his/her predominant cognitive

interest. Finally, the third group (Emancipatory) contained those students with a teacher that had the emancipatory cognitive interest as his/her predominant cognitive interest. Using the SPSS Compare Means subprogram, a "One-way ANOVA" was used to compute the differences among the three means. The same procedures were repeated for each of the three courses.

War and conflict. The 24 War and Conflict teachers who responded to this study, combined with the 319 students who responded, provided 248 students who had teachers with a known cognitive interest. The results of the one-way ANOVA for the War and Conflict course are reported in Table 17.

Table 17

Analysis of Variance for the War and Conflict Course

| <u>Group</u> | <u>n</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------|------------|---------------|---------------------------|
| Technical | 38 | 3.2237 | .5289 |
| Practical | 197 | 3.2893 | .5464 |
| Emancipatory | 13 | 3.2692 | .4385 |
| <u>TOTAL</u> | <u>248</u> | <u>3.2782</u> | <u>.5373</u> |

Levene's Test for Homogeneity of Variances: $F = .782$ $P = .458$

Analysis of Variance

| <u>Source</u> | <u>df</u> | <u>F Ratio</u> | <u>F Probability</u> |
|-----------------------|-----------|----------------|----------------------|
| <u>Between Groups</u> | <u>2</u> | <u>.2383</u> | <u>.7882</u> |

Conclusion. Within the context of the War and Conflict course at ACSC, there was no significant difference among the mean grades of the students on the end of course written examination based on the cognitive interest of their teacher.

War Theory. The 26 War Theory teachers who responded to this study, combined with the 319 students who responded, provided 286 students who had teachers with a known cognitive interest. The results of the one-way ANOVA for the War Theory course are reported in Table 18.

Table 18

Analysis of Variance for the War Theory Course

| <u>Group</u> | <u>n</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------|----------|-------------|---------------------------|
| Technical | 19 | 3.1842 | .4153 |
| Practical | 267 | 3.2154 | .4995 |
| TOTAL | 286 | 3.2133 | .4938 |

Levene's Test for Homogeneity of Variances: $F = .750$ $P = .387$

Analysis of Variance

| <u>Source</u> | <u>df</u> | <u>F Ratio</u> | <u>F Probability</u> |
|----------------|-----------|----------------|----------------------|
| Between Groups | 2 | .0703 | .7910 |

Note. There was no War Theory teacher with the emancipatory cognitive interest as his/her predominant cognitive interest.

Conclusion. Within the context of the War Theory course at ACSC, there was no significant difference among the mean grades of the students on the end of course written examination based on the cognitive interest of their teacher.

Strategic Environment. The 25 Strategic Environment teachers who responded to this study, combined with the 319 students who responded, provided 289 students who had teachers with a known cognitive interest. The results of the one-way ANOVA for the Strategic Environment course are reported in Table 19.

Table 19

Analysis of Variance for the Strategic Environment Course

| <u>Group</u> | <u>n</u> | <u>Mean</u> | <u>Standard Deviation</u> |
|--------------|----------|-------------|---------------------------|
| Practical | 275 | 3.1327 | .5451 |
| Emancipatory | 14 | 3.4643 | .4584 |
| TOTAL | 289 | 3.1488 | .5452 |

Levene's Test for Homogeneity of Variances: $F = .885$ $P = .348$

Analysis of Variance

| <u>Source</u> | <u>df</u> | <u>F Ratio</u> | <u>F Probability</u> |
|----------------|-----------|----------------|----------------------|
| Between Groups | 2 | 4.9955 | .0262 |

Note. There was no Strategic Environment teacher with the technical cognitive interest as his/her predominant cognitive interest.

Conclusion. Within the context of the Strategic Environment course at ACSC, there was a significant difference between the mean grades of the students on the end of course written examination based on the cognitive interest of their teacher.

Summary

This chapter reported the results of the second and third phases of this research study. After addressing two assumptions about the participants in this study, the procedures accomplished to validate the Cognitive Interest Inventory and the results of those procedures were reported. Next, the results of the measures used to determine the reliability of the instrument were reported. Finally, the results of the actual hypothesis testing for each hypothesis were reported.

The data gathered in support of this study indicated that two assumptions made by this researcher concerning the participants in this study were valid. The teachers were similar to most groups found in adult education settings in that very few were

professional educators. At the same time, the students were unlike most groups because of the large number who earned the higher grades.

The results of the different validity measures indicated the Cognitive Interest Inventory was a valid instrument for measuring the cognitive interest of students and teachers. Content validity was verified by a jury of experts and a field test of the inventory. In addition, construct validity was confirmed by a factor analysis which eliminated six items from the inventory. Finally, concurrent validity was confirmed by comparing the instrument to the Philosophy of Adult Education Inventory, an instrument with established validity.

In addition to the instrument's validity, the results of the different reliability measures indicated the Cognitive Interest Inventory was a reliable instrument for measuring the cognitive interest of students and teachers in an adult education setting. Internal consistency of the three scales was confirmed by alpha coefficients ranging from .75 to .84. Internal consistency of the whole instrument was confirmed by split-half reliability coefficients above .80.

Using this valid and reliable instrument to determine the independent variables, the hypotheses of this study were investigated. The three hypotheses were tested three times each, once for each course, for a total of nine statistical comparisons of the means. Based on the data, this researcher failed to reject the first null hypothesis, testing the significance of cognitive interest matches between student and teacher, for the War Theory and Strategic Environment courses, but rejected the first null hypothesis for the War and Conflict course. Additionally, based on the data, this researcher failed to reject the second null hypothesis, testing the significance of the students' cognitive interest, for all three courses. Finally, based on the data, this researcher failed to reject the third null hypothesis, testing the significance of the teachers' cognitive interest, for the War and

Conflict and War Theory courses, but rejected the third null hypothesis for the Strategic Environment course.

A detailed discussion of all results reported in this chapter, the implications of these findings and recommendations for further study will be presented in the following chapter.

V

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

In the previous chapter, the results of this study were reported in detail and discussed briefly. This chapter will expand the discussion of all results reported in Chapter IV and explore the implications of those results. In addition, recommendations for further study are introduced when appropriate. This discussion begins with an overview of the study, including reasons why this researcher believed it was significant. Next, two major assumptions made by this researcher are discussed. Following the discussion of these assumptions, methods used to develop the Cognitive Interest Inventory, results of the validation procedures, and results of the reliability testing are discussed in detail. Finally, the results of the investigation of the research questions examined in this study are explained and conclusions are presented.

Overview of the Study

This study was designed to examine the relationship between the cognitive interests of teachers and students in an adult education setting. The theory of cognitive interests presented in the work of Jürgen Habermas provided the foundation for this research. Habermas believes that all learning occurs through one of three cognitive interests, the technical interest, the practical interest, or the emancipatory interest. In developing the framework of this study, this theory of cognitive interests was combined with the idea that every student and teacher is different and each possesses his/her own cognitive interest.

A thorough review of the literature revealed many educators and authors who cited Habermas extensively and acknowledged the importance of his work. Many (e.g., Wilby, 1979) praised Habermas, using words such as, "one of the intellectual giants of the century." At the same time, this researcher could find no research studies that actually tested his theory of cognitive interests in the classroom. This lack of studies on cognitive interests provided the first reason for engaging in this study.

The review of the literature also revealed many studies on how young children learn and how the differences in learning and teaching styles impact elementary and middle school children. Even though studies (e.g., Dunn, et al., 1995) indicated that adult learners showed greater gains when matched with teachers possessing similar interests, the vast majority of studies focused on children. The fact that this study took place in an adult education setting is the second reason for its initiation.

Although Young (1990) used the work of Habermas to develop a pedagogy for young children and Mezirow (1981) used his work as the foundation for an effective adult education program, the review of the literature showed no evidence of any studies investigating the three learning domains described by Habermas. The originality of this study, being one of the first studies to actually investigate these learning domains, provided a third reason for conducting the study.

Finally, the school that served as the setting for this study, the United States Air Force's Air Command and Staff College (ACSC) is an adult education setting that is very interested in this research. The leadership of the school recognizes the potential for the findings of this study to improve future decisions about curriculum and instruction. The genuine interest in this research by the school where it took place provided added value to this study.

The lack of studies investigating the cognitive interests of Habermas also meant there was no instrument available to measure the cognitive interests of students or

teachers. For this reason, this study included the development of the Cognitive Interest Inventory. This instrument was designed based on extensive research of Habermas' theory of cognitive interests. The purpose of the inventory was to categorize each respondent into his/her primary cognitive interest based on their responses to several items representing each interest.

Validity of any new instrument can be an important contribution to the field. Content validity of the Cognitive Interest Inventory was verified by a jury of three educators who have studied and written about Habermas and his theory of cognitive interests. In addition, construct validity was confirmed by computing a factor analysis of all responses to the inventory. As a result of this factor analysis, six items were eliminated from the study because they loaded on the wrong factor or cross-loaded between factors. Finally, concurrent validity was substantiated by comparing results of the Cognitive Interest Inventory with those of a revised version of the Philosophy of Adult Education Inventory, an established instrument with proven validity and reliability.

In addition to validity, reliability of an instrument is also important. Reliability of the Cognitive Interest Inventory was verified using two separate statistical procedures. The internal consistency of the three scales, each representing one of the three cognitive interests, was measured by computing the alpha coefficient for each scale. In addition, the internal consistency of the instrument, as a whole, was measured by computing the split-half reliability of the instrument.

With the validity and reliability of the Cognitive Interest Inventory established, the instrument was used to address the research questions of this study. Each of the three hypotheses was tested for each of three courses at ACSC (War and Conflict, War Theory, and Strategic Environment). Investigation of the first hypothesis examined the significance of the relationship between students and teachers having the same cognitive interest and performance on the end of course examination. Investigation of the second

hypothesis examined the significance of the relationship between the students' cognitive interest and performance on the end of course examination. Finally, investigation of the third hypothesis examined the significance of the relationship between the teachers' cognitive interest and the students' performance on the end of course examination. All results of this study, reported in Chapter IV, are discussed in detail throughout the remainder of this chapter.

Assumptions

Assumptions about the participants in this study, the teachers and students of ACSC, provided an interesting contrast. First, this researcher assumed the teachers at this school were similar to those in most adult education settings. The literature on adult education indicated that most adult educators have very little preparation to teach adult learners. Based on familiarity with the teachers at ACSC, it was assumed that the group of teachers who participated in this study also had very little experience in educating adults.

In contrast, the students who participated in this study were assumed to be unlike most groups of adult learners. Based on the demographic information about this class (93.5 % had a masters degree or higher), an assumed limitation of this study was the potential for restricted range in the distribution of grades on the final examinations.

To address the first assumption, the teachers were asked to complete two items on the demographic information page of the inventory. The responses to these two items provided this researcher with data concerning the educational background and teaching experience of the teachers who participated in this study. Based on this data (summarized in Tables 1 and 2) this assumption appeared valid. With only four teachers (5.5 %) possessing an education degree and 49 teachers (68.1 %) having three years or less teaching experience, this group of teachers appeared to resemble Galbraith's (1990) typical group of adult educators "who have little formal preparation in the process of

instructing adult learners” (p. xiii). Based on the data, it appeared the teachers who participated in this study were representative of most adult education teachers.

To address the second assumption, two sets of grades were studied. First, the grades for all 601 ACSC students (Table 3) were studied to help set the foundation for this research. In addition, the grades of the 319 students who participated in this study (Table 10) were considered as they provided the dependent variable for the investigation of all hypotheses examined by this study. The percentages for both groups were similar with the 319 United States Air Force students who responded having a higher percentage of the top three grades than the class as a whole.

With 86.5 %, 88.1 %, and 81.2 % of the participating students receiving one of the top three grades in the War and Conflict, War Theory, and Strategic Environment courses respectively, it appeared that the assumption about restricted range was valid. In addition, the large number of participating students who earned the grades of A minus or B (63.9 %, 71.8 % and 65.5 %) appeared to affect the investigation of the hypotheses by producing a lack of variability in the dependent variable. Based on the data, it appeared the students who participated in this study earned grades that were restricted in their range and thus did not have the normal distribution indicative of most groups of learners in the typical adult education setting. The results however, may be similar to those found in adult learners studying higher education at the graduate level.

Implications

The acceptance of these two assumptions as valid has implications for this study and for the school that served as the setting for this research. The implications for this research begin with the ability of these findings to be generalized. Acceptance of the assumption about the teachers, as a group, being similar to most adult educators indicates that the findings of this study can be generalized to other adult education settings. At the same time, the apparent restricted range of student grades and the resulting lack of

variability in the dependent variable appears to have had a negative impact on the findings. First, indications were that this group of students is not very representative of most groups of adult learners. Moreover, the lack of variability between groups may have contributed to the scarcity of significant statistical findings during investigation of the hypotheses of this study.

In addition to the effects confirmation of these assumptions had on the findings of this study, there are also implications for ACSC. Most importantly, the teachers of this school, like most adult educators, may need education in the process of guiding adult learners through the learning process. Based on three years of experience as a teacher, curriculum developer, and course director at ACSC, this researcher believes that faculty development at the school is focused more on training than education.

As evidence of this focus on training, the Curriculum Guide (ACSC, 1996) refers to the process as Faculty Development *Training* [Italics added]. In order to “help students reach higher levels of creative, analytical thought” (ACSC, p. 1), the current practice of training teachers how to teach specific lessons should be replaced with teacher education focused on guiding adults through the learning process. As Erickson (1995) pointed out, it takes thinking teachers to develop thinking students. The quality of students at this school magnifies the importance of developing these thinking teachers necessary to accomplish the school’s mission. It is important for ACSC to develop these thinking teachers through enhanced teacher education rather than lesson specific training.

Recommendations for Further Study

To enhance the research on cognitive interests, research in other adult education settings, using the Cognitive Interest Inventory, is indicated. In a setting where student grades more closely resemble the normal distribution, rather than the restricted range of grades present in this study, it may be possible to better examine the hypotheses tested by this research.

Instrument Design

After reviewing and analyzing the literature on cognitive interests, two things were apparent to this researcher. First, the cognitive interest theory of Jürgen Habermas warranted investigation in the classroom. Second, any instrument designed to measure the cognitive interests of students and teachers would have to be developed as part of this study.

To fill this need, the Cognitive Interest Inventory was developed by this researcher. Based on extensive research of Habermas and his cognitive interests, the items were designed to enable the researcher to determine the predominant cognitive interest of each participant based on his/her responses. Ideas for potential items were taken from a wide variety of sources about Habermas and his theory. The original inventory consisted of 15 items representing each of the three cognitive interests, for a total of 45 items. A Likert-type scale was used for the responses to simplify completion of the inventory and to facilitate the assignment of numerical values to the responses for statistical computations. The potential responses included strongly disagree, disagree, neutral, agree, and strongly agree. For the statistical procedures used in this study, the potential responses were assigned numerical values of 1, 2, 3, 4, and 5 respectively.

Validity Testing

To ensure that any findings of this study were based on a valid instrument, the Cognitive Interest Inventory was tested for content validity, construct validity, and concurrent validity. Content validity was primarily determined by a jury of educators recognized as being knowledgeable about Habermas and his theory of cognitive interests. Construct validity was measured by statistical procedures, using data from the 551 individuals (476 students and 75 teachers) that responded to this study. Finally, concurrent validity was measured by statistical procedures, using data from the 75 teachers who responded to this study.

Content Validity

The test for content validity of this instrument was primarily concerned with the extent to which the inventory items were a representative sample of indicators of a particular cognitive interest. This content validity was principally established by a jury of individuals knowledgeable about Habermas' theory of cognitive interests and familiar with the proposed use of the instrument. The three jurors (see Appendix E for a list of jurors) who contributed their expertise to this study made several suggestions that were extremely useful and resulted in a greatly improved instrument.

Based on juror recommendations, several changes in the structure of the inventory were made making it easier to understand and complete. These changes were described in Chapter IV and require no further discussion. More importantly, this jury validation procedure uncovered possible problems with several specific inventory items. The major contributions made by the jurors were their suggestions on how to change the way 31 of the 45 items were presented so each item would more accurately represent the cognitive interest for which it was designed.

As a result of these recommendations, 10 items were changed significantly and 21 received minor modifications. The significant changes included completely rewriting the item or changing several key words so the item more precisely conveyed the essence of the appropriate cognitive interest. For example, item 34 was changed from: "The most important aspect of social existence is work." to read: "The most important role of education is to prepare people for work, whether paid or unpaid." The minor changes included one or two word modifications that strengthened the item but did not change its meaning. For example, item 24 was changed from: "In education, authority resides in the historical community." to read: "In education, authority resides in the learning community."

There appeared to be substantial agreement among the jurors about the effectiveness of most items. For example, 14 items remained unchanged as none of the jurors made any suggestions concerning these items. In addition, 7 of the 10 items that were changed significantly and 16 of the 21 items that required minor changes received suggestions from at least two of the three jurors. Finally, and most importantly, each of these knowledgeable jurors informed this researcher that each of the 45 items, as modified, accurately represented the cognitive interest for which it was designed.

After all changes recommended by the jurors were made and the 45 items of the inventory were randomly assigned new item numbers, the inventory was field tested as a final measure of content validity. This field test, performed in a graduate level curriculum and instruction class at Auburn University, revealed no additional problems with the inventory. The comments made by this group of graduate students, when combined with the remarks of the jurors, indicated that the inventory was easy to complete, instructions were clear, the amount of time required for completion was not excessive, and the results provided an accurate assessment of each participant's cognitive interest.

Implications. The results of the jury validation and field test of the Cognitive Interest Inventory indicated that it possessed sufficient content validity to be used in this study. If further validity testing revealed that it also possessed sufficient construct and concurrent validity, it could be considered a valid instrument. If these additional tests confirmed this validity, the instrument could be used by other researchers interested in determining the cognitive interests of students and teachers in other educational settings.

Construct Validity

The test for construct validity of this instrument was primarily concerned with the extent to which the inventory measured the characteristics implied by each of the three cognitive interests. It was hypothesized by this researcher that three factors were present

in the Cognitive Interest Inventory. Ideally, the factor analysis would have produced three factors, each with 15 items that loaded significantly on the appropriate factor and had zero or near zero loadings on the other two.

In reality, the “Rotated Factor Matrix” (Tables 4 - 6) confirmed the presence of three factors, but the technical, practical, and emancipatory interests had 15, 11, and 13 items respectively. The statistical significance of this three factor model was computed by SPSS as part of the “maximum likelihood” extraction of factors. The computed Chi-square statistic with a significance level of .0000 indicated a very high significance level and appeared to confirm the presence of three factors and 39 valid items in the Cognitive Interest Inventory.

In addition, analysis of the Factor Score Coefficient Matrix (Appendix O) revealed that 37 of the 45 items had the largest coefficient for the appropriate factor. Of the eight items (5, 15, 16, 22, 30, 35, 39, and 43) that had higher coefficients on other factors, six (5, 16, 22, 30, 35, and 43) were also identified as either loading on the wrong factor or cross-loading between factors by the Rotated Factor Matrix. The decision was made, by this researcher, to remove from this study those items that were identified by both the Rotated Factor Matrix and Factor Score Coefficient Matrix as loading on the wrong factor.

Implications. As a result of the factor analysis, six items (5, 16, 22, 30, 35, and 43) were removed from all future computations of this study. Only the 39 items confirmed by the factor analysis were used to measure the reliability of the instrument. In addition, only these 39 items were used to address the research questions of this study. As a result, there was a different number of items representing each cognitive interest.

This researcher had initially planned to determine the cognitive interest of each respondent by adding the scores of the technical items, practical items, and emancipatory items. The total score for each cognitive interest would have been between 15 and 75

and the interest with the highest total would have become the cognitive interest for each respondent. As a result of removing six items, based on the factor analysis, this method was no longer appropriate. As a result, the mean score for each interest was computed and the cognitive interest with the highest mean became the respondent's cognitive interest for the purpose of testing the hypotheses investigated in this study.

The results of the factor analysis of the Cognitive Interest Inventory confirmed the presence of three factors and indicated that it possessed sufficient construct validity to be used in this study. These findings appear to confirm the findings of the jury that the Cognitive Interest Inventory is a valid instrument for identifying the cognitive interests of students and teachers. If the final validity test confirmed the presence of sufficient concurrent validity, the instrument could be used by other researchers interested in determining the cognitive interests of students and teachers in other educational settings.

Concurrent Validity

The test for concurrent validity of this instrument was primarily concerned with the extent to which the scores attained through the use of this inventory were related to another indicator of the same criterion. A successful test of the planned concurrent validity procedures on the small group involved in the field test, described earlier in this chapter, indicated the usefulness of this procedure.

Robinson (1997) validated Zinn's five philosophies of adult education to Habermas using a jury of recognized experts on Habermas and his theory. As a result of this jury validation, the headings on page 13 of Zinn's instrument (contained in Appendix L) were changed to reflect the cognitive interest(s) best represented by the characteristics present in each philosophy. The revised headings, (see Appendix M) Practical/Emancipatory, Technical, Emancipatory/Practical, Technical/Practical, and Emancipatory were used in this study. The statistical significance of the correlation

between the Cognitive Interest Inventory and the PAEI, using Robinson's revised headings indicated that the two instruments were measuring the same construct.

Implications. Based on the statistical significance of the correlation between the Cognitive Interest Inventory and the PAEI and the acceptance of the PAEI as a valid and reliable instrument, this test of concurrent validity indicated that the Cognitive Interest Inventory was measuring the same construct as an established valid instrument. This concurrent validity, when combined with content validity verified by a jury of experts and construct validity confirmed by factor analysis, indicated that the Cognitive Interest Inventory is a valid instrument for measuring the cognitive interests of students and teachers. It is the opinion of this researcher that this instrument, in its present form, could be used to measure the cognitive interests of teachers at any level and students of high school age or older.

Recommendations for Further Study. To enhance the research on cognitive interests and test the validity of the Cognitive Interest Inventory in other settings, research using this instrument at the high school, junior college, and university level is indicated. This would not only verify the validity of the instrument in settings other than adult education, but would potentially provide data with more variability to enable educators to better understand the significance of the relationships investigated by this study.

Reliability Testing

Statistical reliability testing procedures were used to determine the internal consistency of each of the three scales contained in the instrument (alpha coefficient) and the internal consistency of the instrument as a whole (split-half). These measures indicated to what extent the instrument yielded consistent results. The response rate was also the same (80.1 %) and, as in the factor analysis, the responses of all 551 respondents were used.

Alpha Coefficients

Alpha coefficients of .8187, .7538, and .8358 for the technical interest, practical interest, and emancipatory interest, respectively, indicated high reliability within each of the three scales. It was not surprising that Habermas' practical interest had the lowest reliability of the three interests. According to Grundy (1987), the practical interest is compatible with both the technical interest and the emancipatory interest. The practical interest is, in many ways, an outgrowth of the technical interest and the emancipatory interest was developed from the practical interest. At the same time, the technical and emancipatory interests are "largely incompatible" (p. 99). For this reason, it is possible for some confusion to exist between the technical and practical interests and the practical and emancipatory interests. If the three cognitive interests are viewed as a continuum, there is potential for confusion on only one side of the technical and emancipatory interests, but potential for confusion on both sides of the practical interest. This may have been a contributing factor in the lower reliability of the practical interest.

Split-half Reliability

A second measure of internal consistency, split-half reliability provided two reliability coefficients. These coefficients indicated a high degree of internal consistency throughout the entire instrument. An unequal-length Spearman-Brown for the whole instrument of .8193, combined with alpha coefficients for each half of .8108 and .8098 respectively, indicated that the Cognitive Interest Inventory, as a whole, was a reliable instrument.

The Spearman-Brown formula is a statistical procedure that employs the correlation between split-halves of an instrument to estimate the reliability of the entire instrument (Ary, et al., 1996, p. 574). The SPSS output provided both an "equal length Spearman-Brown" and an "unequal-length Spearman-Brown." In the reliability analysis of this instrument, they only differed by .0001 so both appeared to represent the

reliability of the instrument equally. Based on the fact that the reliability analysis was computed on an instrument with 39 items, the unequal-length coefficient was used. In addition, the split-half analysis provided an alpha coefficient for both halves of the Cognitive Interest Inventory of .8108 for part 1 and .8098 for part 2. These coefficients indicated high internal consistency for the entire instrument. An unequal-length Spearman-Brown and alpha coefficients for each half all higher than .80 indicated that the Cognitive Interest Inventory, as a whole, was a reliable instrument for measuring the cognitive interests of students and teachers.

Implications

The results of the alpha coefficient reliability measurements indicated each of the three scales present in the Cognitive Interest Inventory contained a high degree of reliability. In addition, the results of the split-half reliability measurements indicated that the entire instrument contained a high degree of reliability. Based on these measures of reliability, it was determined that the Cognitive Interest Inventory was a reliable instrument for measuring the cognitive interests of students and teachers in this study. It is the opinion of this researcher that this instrument is reliable for measuring the cognitive interests of students and teachers in other educational settings.

Acceptable reliability of an instrument can best be stated as reliability that is as good or better than the reliability of competing measures (Ary, et al., 1996). Since no other instruments could be found that measure the cognitive interests of students and teachers, the reliability coefficients of this instrument, ranging from .7538 to .8358, were considered acceptable measures of reliability.

Recommendations for Further Study

As a result of constraints placed on this research, it was not possible to measure the test-retest reliability of the Cognitive Interest Inventory. The ability of the instrument to maintain its reliability over time under similar conditions would have been an

important measure for this study because the inventory was administered several months after the courses were taught. To enhance the research on cognitive interests and test the ability of this instrument to retain its reliability over time, another study using this instrument is indicated. The study should take place in a setting and at a time that allows the instrument to be administered a second time to the same respondents. Comparing each individual's responses to repeated applications of the instrument would provide a measure of test-retest reliability that would enhance the usability of the instrument.

Investigation of the Hypotheses

Having determined that the Cognitive Interest Inventory was a valid and reliable instrument for measuring the cognitive interests of students and teachers, it was used to determine the independent variables for testing of the three hypotheses investigated in this study. Each United States Air Force student ($n = 319$) and each teacher ($n = 75$) were categorized based on his/her responses as having the predominant cognitive interest of technical, practical, or emancipatory. Based on the results from a previous study (Butler, 1995), it was anticipated, by this researcher, that the majority of students and teachers would possess the practical interest. This researcher was surprised however, by the overwhelming percentages of students (75.8 %) and teachers (89.3 %) who possessed the practical interest as their dominant interest (see Table 8).

As a result of these unexpectedly high numbers, a more detailed look at the results was accomplished. The purpose of this additional scrutiny was to determine how many of the respondents were clearly placed into their cognitive interest category and if there were a high number of respondents who had means for two or more cognitive interests that were very close (in this study, there were no respondents with identical scores for more than one cognitive interest). A large majority of respondents (85.3 % of the students and 89.6 % of the teachers) had scores that clearly placed them into a single cognitive interest. It was not surprising that most (46) of the "close calls" (difference

between two means of less than .20) were between the technical and practical cognitive interests. For the reasons discussed in the reliability section of this chapter, there is potential for confusion between these two interests. Based on this additional review of the numbers, it appears that the great majority of respondents in this study were appropriately placed into the “practical” cognitive interest.

An important factor that may have contributed to this large number of participants who endorsed the practical interest was enactment of the ACSC curriculum. The majority of lessons presented at ACSC are guided discussions, which, on the surface, appear to fit most suitably into the practical interest. The timing of this study meant the students and teachers had been participating in these guided discussions for nearly seven months. Perhaps, they responded to the interest in which they were currently most familiar, even if that was not their true cognitive interest.

These cognitive interests, summarized in Table 8, served as the independent variable for testing of the second and third hypotheses. The cognitive interest of the students was used to test the second hypothesis and the cognitive interest of the teachers was used to test the third hypothesis. To determine the independent variable for testing of the first hypothesis, the cognitive interest of each student was compared to the cognitive interest of his/her teacher to determine if each student had a cognitive interest match or mismatch with his/her teacher. These cognitive interest matches and mismatches (see Table 9) served as the independent variable for testing of the first hypothesis. The high percentage of cognitive interest matches for each course (66.1 %, 73.4 %, and 73.4 %) is probably due in part to the large number of students and teachers who were categorized as practical by their responses to the inventory.

The dependent variable for the investigation of all three hypotheses examined by this study was the student’s grade on the end of course examination for each of the three courses. The grades for the 319 students who were participants in this study were

reported in Table 10. As discussed earlier in this chapter, a large majority of students earned one of the top three grades (A, A minus, or B) in each course. In addition, the large number of student in each course (63.9 %, 71.8 %, and 65.5 %) who earned either an A minus or a B on the examination had the potential to limit the variability in the dependent variable to the extent that the significance of the relationships is not fully established statistically by this study.

The overall investigation of the hypotheses examined in this study actually consisted of nine individual studies of the students and teachers at ACSC. Each of the three hypotheses was examined separately for each of the three courses (War and Conflict, War Theory, and Strategic Environment) that were the focus of this study. The statistical procedures used to determine the significance of the relationships studied included three “t-tests” and six “one-way ANOVAs.” The three “t-tests” were used to determine the significance of the relationship investigated by the first hypothesis for each of the courses. The six “one-way ANOVAs” were used to determine the significance of the relationship investigated by the second and third hypotheses for each of the three courses. Means and standard deviations were reported for each of the nine studies individually (Tables 11 - 19).

Hypothesis Number 1

Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference between the mean grade of students who have the same cognitive interest as their teacher and the mean grade of students who have a different cognitive interest than their teacher on the end of course written examinations.

War and Conflict. As reported in Table 11, the results of the homogeneity test ($F = .000$ and $P = .988$) indicated virtually no difference between the variances of the two groups. As a result, any difference in the means could be attributed to the independent

variable. In this course, the students who had a cognitive interest match with their teacher performed better on the end of course written examination with a difference in the means ($t = 1.85$) that was statistically significant for a one-tailed test at the .05 level. The difference in the means between the two groups produced a two-tailed significance level of .07. Using a directional alternative hypothesis however, the t-value of 1.85 with a df of 246 is significant for a one-tailed test. (Table of t-values, Ary, et al., 1996, p. 551)

The literature review indicated that some educators (e.g. Dunn, et al., 1990) believed matching students and teachers by their cognitive interest improved student performance, while others (e.g. Cornett, 1983) did not view matching as a significant contributor to student success. There were no indications however, that matching would have a negative impact on student performance. For this reason, a directional alternative hypothesis in the positive direction was indicated. Based on this data, and the predetermined significance level for this study of .05, this researcher rejected null hypothesis number 1 for the War and Conflict course. The alternative hypothesis (Within the context of the War and Conflict course at ACSC, the mean grade of students who have the same cognitive interest as their teacher will be significantly higher than the mean grade of students who have a different cognitive interest than their teacher on the end of course written examinations.) must be considered.

War Theory. As reported in Table 12, the results of the homogeneity test ($F = .038$ and $P = .846$) indicated some difference between the variances of the two groups. As a result, most of the difference in the means could be attributed to the independent variable, but it may have been influenced by the difference in variances of the two groups. In this course, the students who had a cognitive interest match with their teacher performed slightly better on the end of course written examination but the small difference in the means ($p = .46$) was not statistically significant at the .05 level. In fact,

this significance level indicated that the difference in the means could occur by chance nearly one-half of the time.

Strategic Environment. As reported in Table 13, the results of the homogeneity test ($F = .005$ and $P = .941$) indicated very little difference between the variances of the two groups. As a result, any difference in the means could be attributed to the independent variable. In this course, the students who had a cognitive interest match with their teacher performed better on the end of course written examination but the difference in the means ($p = .183$) was not statistically significant at the .05 level.

Conclusions. Within the context of the War and Conflict course at ACSC, the mean grade of students who had the same cognitive interest as their teacher was significantly higher than the mean grade of students who had a different cognitive interest than their teacher on the end of course written examinations.

Within the context of the War Theory and Strategic Environment courses at ACSC, there was no significant difference between the mean grade of students who had the same cognitive interest as their teacher and the mean grade of students who had a different cognitive interest than their teacher on the end of course written examinations.

Implications. Based on this study alone, indications are that matching students and teachers according to their predominant cognitive interest provided mixed results. While students in all three courses with the same cognitive interest as their teacher performed better on the end of course written examination than students with a different cognitive interest than their teacher, the difference was only statistically significant in one of the three courses based on the predetermined significance level of this study. It appears that Cornett (1983) may have been correct when she concluded that, "matching produces inconsistent achievement outcomes" (p.41). The results of this study also appear to support Cornett's belief that a mix of matching and intentional mismatching to

increase the learning abilities of students and the teaching abilities of teachers may be advantageous to everyone involved.

Recommendations for Further Study. Based on the apparent restricted range of the dependent variable found in this study and the finding that students in all three courses performed better (though only statistically significant in one course) when their teacher had the same cognitive interest, further study on cognitive interests is indicated. Another study, using the Cognitive Interest Inventory, in a setting where the potential for the restricted range of student grades is not as high may provide a clearer understanding of the significance of the relationship between cognitive interest matches and student performance.

Hypothesis Number 2

Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examinations.

War and Conflict. As reported in Table 14, the results of the homogeneity test ($F = .348$ and $P = .707$) indicated some difference among the variances of the three groups. As a result, most of the difference among the means could be attributed to the independent variable, but may have been influenced by the inherent difference in variances among the groups. In this course, students with the "practical" cognitive interest performed best, followed by students with the "emancipatory" cognitive interest and, finally, students with the "technical" cognitive interest, but the difference among the means ($p = .191$) was not statistically significant at the .05 level.

War Theory. As reported in Table 15, the results of the homogeneity test ($F = .199$ and $P = .820$) indicated some difference among the variances of the three groups. As a result, most of the difference among the means could be attributed to the

independent variable, but may have been influenced by the inherent difference in variances among the groups. In this course, students with the “emancipatory” cognitive interest performed best, followed by students with the “practical” cognitive interest and, finally, students with the “technical” cognitive interest, but the difference among the means ($p = .347$) was not statistically significant at the .05 level.

Strategic Environment. As reported in Table 16, the results of the homogeneity test ($F = .584$ and $P = .558$) indicated a great deal of difference among the variances of the three groups. As a result, much of the difference among the means may have been influenced by the inherent difference in variances among the groups and any significant findings would have to be viewed carefully. In this course, students with the “practical” cognitive interest performed best, followed by students with the “emancipatory” cognitive interest and, finally, students with the “technical” cognitive interest, but the difference among the means ($p = .090$) was not statistically significant at the .05 level.

Conclusion. Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there was no significant difference among the mean grades of the three student groups (technical, practical, and emancipatory) on the end of course written examinations.

Implications. “We realize that there is no right or wrong way to learn” (Cornett, 1983, p. 27). This study began with the belief that none of the three cognitive interests provided more effective learning than the others, they were merely different. The results attained through the testing of this hypothesis provides support for this belief. Very small differences in the means, and different cognitive interests having the highest mean for different courses, indicated that each was an equally effective cognitive interest for the students who participated in this study.

Habermas’ theory of three cognitive interests, none of which can be viewed as “the only way to learn” is supported by this finding. His disapproval of the positivists’

insistence on “technical” teaching and learning and some modern philosophers’ argument that the “practical” knowledge is the fundamental form of learning appear to be upheld by these results. At the same time, Habermas’ belief in the superiority of the “emancipatory” interest seems to be disputed.

It is important for teachers to understand that students can learn in a number of different ways. As the results of this study indicate, each cognitive interest can be just as effective as the others. It is also important for teachers to recognize the different cognitive interests of their students so they can provide a learning environment that is conducive to success for every student. “Since learners differ, the search for generally superior methods should be supplemented by a search for ways to fit the instruction to each kind of learner” (Cronbach & Snow, 1977, p. 1).

Hypothesis Number 3

Within the context of the War and Conflict, War Theory, and Strategic Environment courses at ACSC, there is no significant difference among the mean grades of the students on the end of course written examinations based on the cognitive interest of their teacher.

War and Conflict. Of the 248 students who had teachers with a known cognitive interest, 38 had teachers with the “technical” interest, 197 had teachers with the “practical” interest, and 13 had teachers with the “emancipatory” interest.

As reported in Table 17, the results of the homogeneity test ($F = .782$ and $P = .458$) indicated a great deal of difference among the variances of the three groups. As a result, much of the difference among the means may have been influenced by the inherent difference in variances among the groups and any significant findings should be viewed carefully. In this course, students with “practical” teachers performed best, followed by students with “emancipatory” teachers and, finally, students with “technical” teachers, but the difference among the means ($p = .788$) was not statistically significant

at the .05 level. This very high probability indicated that the differences among the means for this group of students could occur simply by chance almost 80 % of the time. This indicated that the cognitive interest of the teacher was not a very good predictor of student performance during the War and Conflict course.

War Theory. Of the 286 students who had teachers with a known cognitive interest, 19 had teachers with the “technical” interest, and 267 had teachers with the “practical” interest. There were no War Theory teachers with the “emancipatory” interest.

As reported in Table 18, the results of the homogeneity test ($F = .750$ and $P = .387$) indicated a great deal of difference between the variances of the two groups. As a result, much of the difference between the means may have been influenced by the inherent difference in variances between the groups and any significant findings should be viewed carefully. In this course, students with “practical” teachers performed best, followed by students with “technical” teachers, but the difference between the means ($p = .791$) was not statistically significant at the .05 level. This very high probability indicated that the differences between the means for this group of students could occur simply by chance almost 80 % of the time. This indicated that the cognitive interest of the teacher was not a very good predictor of student performance during the War Theory course.

Strategic Environment. Of the 289 students who had teachers with a known cognitive interest, 275 had teachers with the “practical” interest and 14 had students with the “emancipatory” interest. There were no Strategic Environment teachers with the “technical” interest.

As reported in Table 19, the results of the homogeneity test ($F = .885$ and $P = .348$) indicated a great deal of difference between the variances of the two groups. As a result, much of the difference between the means may have been influenced by the

inherent difference in variances between the groups and any significant findings should be viewed carefully. In this course, students with “emancipatory” teachers performed best, followed by students with “practical” teachers, and the difference between the means ($p = .026$) was statistically significant at the .05 level. This significance level indicated that the performance of students could be predicted by knowing the cognitive interest of their teacher.

Conclusions. Within the context of the War and Conflict and War Theory courses at ACSC, there was no significant difference among the mean grades of the students on the end of course written examinations based on the cognitive interest of their teacher.

Within the context of the Strategic Environment course at ACSC there was a significant difference between the mean grades of the students on the end of course written examinations based on the cognitive interest of their teacher.

Implications. For the same reasons this study began with the belief that none of the three cognitive interests provided more effective learning than the others, there was also the belief that none of the three cognitive interests provided more effective teaching. The results attained through the testing of this hypothesis for two of the courses (War and Conflict and War Theory) indicated that this was a valid belief. Very small differences in the means indicated that each was an equally effective cognitive interest for the teachers who participated in this study.

In contrast, the results attained through the testing of this hypothesis for the third course (Strategic Environment) indicated that students with “emancipatory” teachers performed better than students with “practical” teachers. There are several possible reasons for this significant finding. As stated earlier, the test of homogeneity revealed a great deal of difference in variance between the two groups. This could have accounted for all or part of this significant finding. Also, with only 14 students having

“emancipatory” teachers, a few very high grades could have skewed the mean and helped produce the significant difference. A final possibility is that students of “emancipatory” teachers actually do perform better than students of “practical” teachers as indicated by this result.

Whether an educator accepts this significant finding or attributes it to the reasons mentioned above, the results of the investigation of this hypothesis provided important implications for all teachers. On one hand, if the finding is accepted the implication is that teachers should strive to be more “emancipatory” in the way they interact with students, adding credence to Habermas’ belief in the emancipatory cognitive interest. Conversely, if an educator chooses not to accept the finding for any reason, the implications are similar to those discussed earlier concerning the investigation of the second hypothesis. It is not only important for teachers and administrators to understand that students learn in a number of different ways, but there are also different ways to be an effective teacher. Habermas believes there are three ways to constitute knowledge and the results of this study indicate, in two of the three courses, that students performed just as well regardless of the cognitive interest of their teacher. In either case, as the literature (e.g., Kaplan & Kies, 1995) emphasized, it is important for teachers to recognize their own cognitive interest so they have a better understanding of how they relate to their students in order to provide a learning environment that is conducive to success for every student.

Recommendations for Further Study. To enhance the research on cognitive interests and to help confirm or refute this significant finding, further study concerning the performance of students and the cognitive interest of their teacher is indicated. With additional data on the cognitive interest of teachers and the performance of their students, it may be possible to develop a better understanding of the significance of this relationship.

Overall Conclusions

Based on the results of this study, it is this researcher's judgment that the most important contribution of this study was the development of the Cognitive Interest Inventory. Content, construct, and concurrent validity measures confirmed the validity of the instrument. In addition, alpha coefficient reliability computations indicated high reliability of each of the three scales contained in the instrument and split-half reliability computations indicated high reliability of the instrument as a whole. Based on this data, it is a valid and reliable instrument that can be used by teachers and students in an adult education setting to identify their primary cognitive interest. It is also the judgment of this researcher that the instrument could be used by teachers at any level and students of high school age or older and retain its validity and reliability.

Two questions were asked several times by respondents to this study. The first question was, whether the instrument was seeking to ascertain how the respondent thought education should be or how he/she thought it actually was. The intent of the instrument was for respondents to answer each item with their beliefs about education in an ideal situation. The instructions for completion should be made clearer in this regard to avoid confusion among future respondents. The second question was, what age level the study was concerned with. Since this study was concerned with adult education, this researcher informed the respondents to consider adult education when responding to the items on the instrument. Future users of this instrument should decide what level of education they are concerned with and make sure that potential respondents clearly understand this level.

All 551 copies of the Cognitive Interest Inventory that were returned during this study were scored by this researcher. For this reason, no instructions for scoring the instrument were included with the inventory. Any future users of this instrument will need these instructions in order to score the responses and determine the cognitive

interest of each respondent. A copy of the instructions for scoring the Cognitive Interest Inventory is provided in Appendix P.

Many educators advocate matching students and teachers by their cognitive interest to ensure success for all students. There are also many educators who do not consider matching an important factor in the success of students. The results attained by testing the first hypothesis of this study suggested that matching students and teachers may be indicative of improved performance. Even though students in all three courses performed better when their cognitive interest matched the cognitive interest of their teacher, the difference was significant in only one of the three courses. Further study is recommended in a setting with greater variability of student grades to better understand the importance of cognitive interest matching of students and teachers.

Not all students possess the same cognitive interest. Teachers must realize that, "If we limit ourselves to only one single interest, we will lose sight of other possibilities" (Li & Reigeluth, 1995, p. 14). The results attained by testing the second hypothesis of this study indicated that the cognitive interest of the student could not be used to predict any significant difference in his/her performance. Teachers must realize that students can and do learn in a number of different ways and provide a learning environment that is conducive to success for all students, regardless of their cognitive interest.

"There cannot be one best way to teach" (Guild and Garger, 1985, p. 23). It is important for all educators to understand that teaching with any cognitive interest can be just as effective as teaching with any other. The results attained by testing the third hypothesis of this study indicated that, in two of three courses, the cognitive interest of the teacher was not an effective indicator of student performance. Even though all three cognitive interests appear to be effective for teachers, it is still important for teachers to recognize their own cognitive interest. When they do so, teachers will have a better understanding of how they relate to students and will be able to provide a learning

environment that is conducive to success for all students. It will also enable them to examine the extent to which they are actually using teaching methods that reflect their stated beliefs about teaching and learning. Further study is recommended to help confirm or refute the significant finding that students of “emancipatory” teachers perform better than students of “practical” teachers.

The theory of Jürgen Habermas provided an excellent theoretical framework for this study. It appears that all three cognitive interests provide students and teachers with effective ways to constitute knowledge. The positivists, with whom Habermas so rigorously objected were not totally correct. Modern philosophers who believe that hermeneutics is the only real way to learn were not totally correct either. Even Habermas who proclaimed the emancipatory interest as the preferred path to knowledge is not absolutely right. This examination of this theory concludes with the belief that much more investigation into the cognitive interest theory of Habermas will provide educators with a better understanding of how people learn.

Some educators view “technical” education as the “old” education. Others refer to it as “traditional” education. In addition, the “practical” education has often been compared to “progressive” education, and “emancipatory” education is referred to by some educators as the “new” education. It is not important which cognitive interest the student possesses. It is also not important which cognitive interest the teacher possesses. What is important is that the student-teacher relationship results in education. As Dewey (1938) told us nearly 60 years ago:

The fundamental issue is not of new versus old education nor of progressive against traditional education but a question of what anything whatever must be to be worthy of the name *education*. . . . What we want and need is education pure and simple. (p. 90)

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APPENDIX A
COGNITIVE INTEREST INVENTORY

(Cover Letter)

March 10, 1997

<Rank Last Name>

ACSC

Maxwell AFB, AL 36112

Dear <Rank Last Name>:

As a member of the Air Command and Staff College community, your insights into the curriculum and the learning process are extremely valuable to the continued success of this school.

You are one of the group of people being asked to provide your ideas on how people learn, both in theory and in practice. To ensure that the results of this study truly reflect the thinking of the ACSC community, it is important that each inventory be completed and returned as soon as possible.

You are assured of complete anonymity. The inventory has an identification number which will be used to track returned inventories. Your name will never be associated with any responses. To ensure you have the correct inventory please check the identification number in the lower right corner of this cover letter with the number at the top of each page of the inventory. To ensure your anonymity, please remove this cover letter before returning your inventory.

I will be happy to answer any questions you may have about this study. You can reach me any time at (334)265-1041, or via E Mail at ssbutler@sprynet.com.

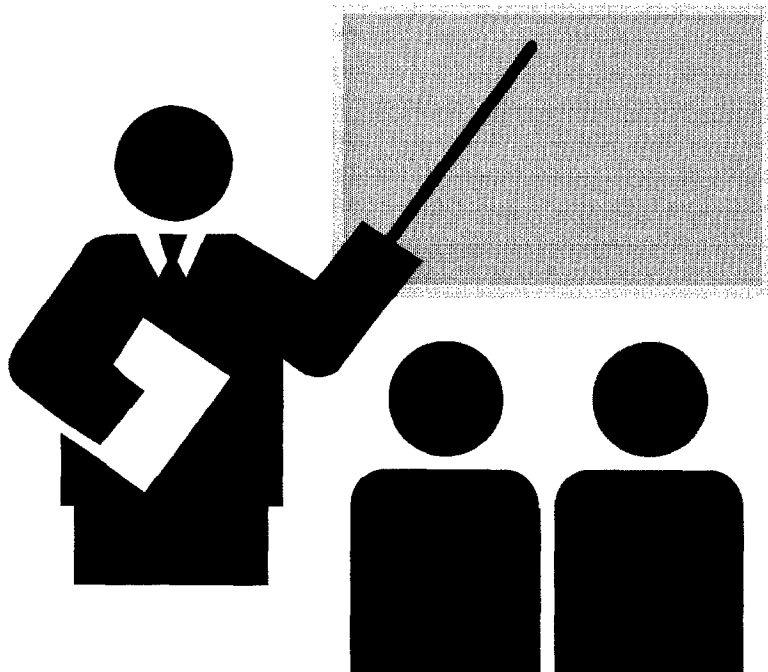
Participation in this study is completely voluntary. Your return of the completed inventory implies that you give your informed consent for inclusion of the data contained in your responses to be used in this study.

Thank you very much for your assistance.

Sincerely,

Stephen L. Butler, Lt Col, USAF
Project Director

COGNITIVE INTEREST INVENTORY



AIR COMMAND AND STAFF COLLEGE STUDENTS AND TEACHERS

Please return your completed questionnaire to:

Lt Colonel Steve Butler
Air Command and Staff College
Maxwell AFB, AL 36112

COGNITIVE INTEREST INVENTORY

FOREWORD

The German philosopher Jürgen Habermas differentiates three generic areas in which human interest generates knowledge. These areas are “knowledge constitutive” because they determine categories relevant to what we interpret as knowledge. They also determine the mode of discovering knowledge and for establishing whether knowledge claims are warranted. The purpose of this inventory is to establish which of these three cognitive interests is the most influential in your experiences as a learner and/or teacher.

INSTRUCTIONS FOR COMPLETION

Each of the forty-five (45) items on the inventory contains a statement about education in general. Underneath each statement is a scale from SD to SA.

To complete the inventory, read each statement. On the scale, **CIRCLE** the letter(s) that best describes your general beliefs about each statement. The letters on the scale represent the following: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, and SA = Strongly Agree.

Please respond to all items indicating your honest opinion of each statement. If you have no opinion or are not sure about a statement, **CIRCLE N**. **THERE ARE NO RIGHT ANSWERS!!!** There aren't even any answers better than others, it is simply what *you* believe.

Students may return completed inventories to your DEC instructor or one of the central collection boxes in DEC or CVV. Teachers may return completed inventories to your respective department heads.

THANKS FOR YOUR TIME.

SD D N A SA
 STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the letter(s) that best represents your beliefs about each statement.

1. Among key concepts for effective education are: behavioral objectives, needs assessment, and competency-based education.

SD D N A SA

2. Learning involves communication where expectations about behavior must be understood by at least two people.

SD D N A SA

3. Most successful educational situations are structured, with clear objectives and feedback from teacher to learner.

SD D N A SA

4. The primary purpose of education is to prepare the learner to control and manage his or her environment.

SD D N A SA

5. The most important role of education is the development of mutual understanding with others.

SD D N A SA

6. In education, authority resides in the learning community.

SD D N A SA

7. Curriculum should be designed to control the process of learning by controlling the process of teaching.

SD D N A SA

SD D N A SA
 STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the letter(s) that best represents your beliefs about each statement.

8. The desired knowledge generated by the teacher-student relationship is the student observing through experimentation, and reaching the correct conclusion.

SD D N A SA

9. Learning involves reflection about the way history and culture have helped to form the learner's roles and expectations.

SD D N A SA

10. The most important learning outcome for the student is an ability to transcend current perspectives.

SD D N A SA

11. The most important results of education include increased skills, behaviors, or competencies.

SD D N A SA

12. The outcome each teacher should look for in his/her students is effective behavior.

SD D N A SA

13. The primary purpose of education is to prepare the learner to understand the environment so he/she can interact with it.

SD D N A SA

14. The fundamental basis of learning is found in controlled observation and experimentation of the content studied.

SD D N A SA

15. The role of theory in education is to help construct new knowledge and practice.

SD D N A SA

SD D N A SA
 STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the letter(s) that best represents your beliefs about each statement.

16. Good teachers recognize social and cultural issues that may place constraints on each learner.

SD D N A SA

17. The desired knowledge generated by the teacher-student relationship is the ability of the student to generate critical action.

SD D N A SA

18. The fundamental basis of learning provides the learner with an accurate, in-depth understanding of his/her historical situation.

SD D N A SA

19. The most important learning outcome for the student is acquiring improved skills.

SD D N A SA

20. The fundamental basis of learning allows for the consideration of alternative interpretations.

SD D N A SA

21. Good teachers use their professional judgment to develop an effective learning environment.

SD D N A SA

22. The role of theory in education is to serve as a source of meanings for our actions.

SD D N A SA

23. The most important results of education include identifying constraints on social change.

SD D N A SA

| | | | | |
|-------------------|----------|---------|-------|----------------|
| SD | D | N | A | SA |
| STRONGLY DISAGREE | DISAGREE | NEUTRAL | AGREE | STRONGLY AGREE |

Please CIRCLE the letter(s) that best represents your beliefs about each statement.

24. The real value of any theory is that it penetrates the current system of power.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

25. Most successful educational situations are flexible enough to allow for interaction with others who have similar interests.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

26. The most important role of education is to prepare people for work, whether paid or unpaid.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

27. The primary purpose of education is to prepare the learner to be liberated from the presently existing environment.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

28. Among key concepts for effective education are: role playing, resolving conflict, discussion and dialogue, learning groups, and performance-based education.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

29. Curriculum should be designed so the teacher and student understand each other since both are concerned with promoting the right action.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

30. Curriculum should be designed to empower both teacher and student.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

31. The outcome each teacher should look for in his/her students is a desire to create a just society.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

| | | | | |
|-------------------|----------|---------|-------|----------------|
| SD | D | N | A | SA |
| STRONGLY DISAGREE | DISAGREE | NEUTRAL | AGREE | STRONGLY AGREE |

Please CIRCLE the letter(s) that best represents your beliefs about each statement.

32. Good teachers are efficient in their attainment of stated objectives.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

33. Among key concepts for effective education are: access to alternative perspectives, Socratic dialogue, and awareness of the role of ideology.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

34. The desired knowledge generated by the teacher-student relationship is the student observing the situation as a whole and making meaning from it.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

35. In education, authority resides in the practitioner.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

36. Learning involves predictions about observable events that can be proven correct or incorrect.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

37. The most important learning outcome for the student is developing sound judgment.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

38. The most important role of education is to prepare people to represent their own interests.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

39. In education, authority resides in the plan.

| | | | | |
|----|---|---|---|----|
| SD | D | N | A | SA |
|----|---|---|---|----|

SD D N A SA
 STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the letter(s) that best represents your beliefs about each statement.

40. The most important results of education include helping learners interpret, construct meaning, and interact with others.

SD D N A SA

41. The real value of any theory is that it provides understanding.

SD D N A SA

42. The role of theory in education is to guide our actions.

SD D N A SA

43. The outcome each teacher should look for in his/her students is meaningful action.

SD D N A SA

44. The real value of any theory is that it provides direction.

SD D N A SA

45. Most successful educational situations provide a vivid awareness of social and cultural issues that impact the student daily.

SD D N A SA

DEMOGRAPHIC INFORMATION

Everyone (students *and* teachers) please answer question 1.

1. My undergraduate degree is in: _____

Students only please answer question 2.

2. Circle the letter of the response that best describes you.

- A. United States Air Force
- B. United States Navy
- C. United States Army
- D. United States Marine Corps
- E. United States Air Force Reserve
- F. Air National Guard
- G. Civilian
- H. International Officer

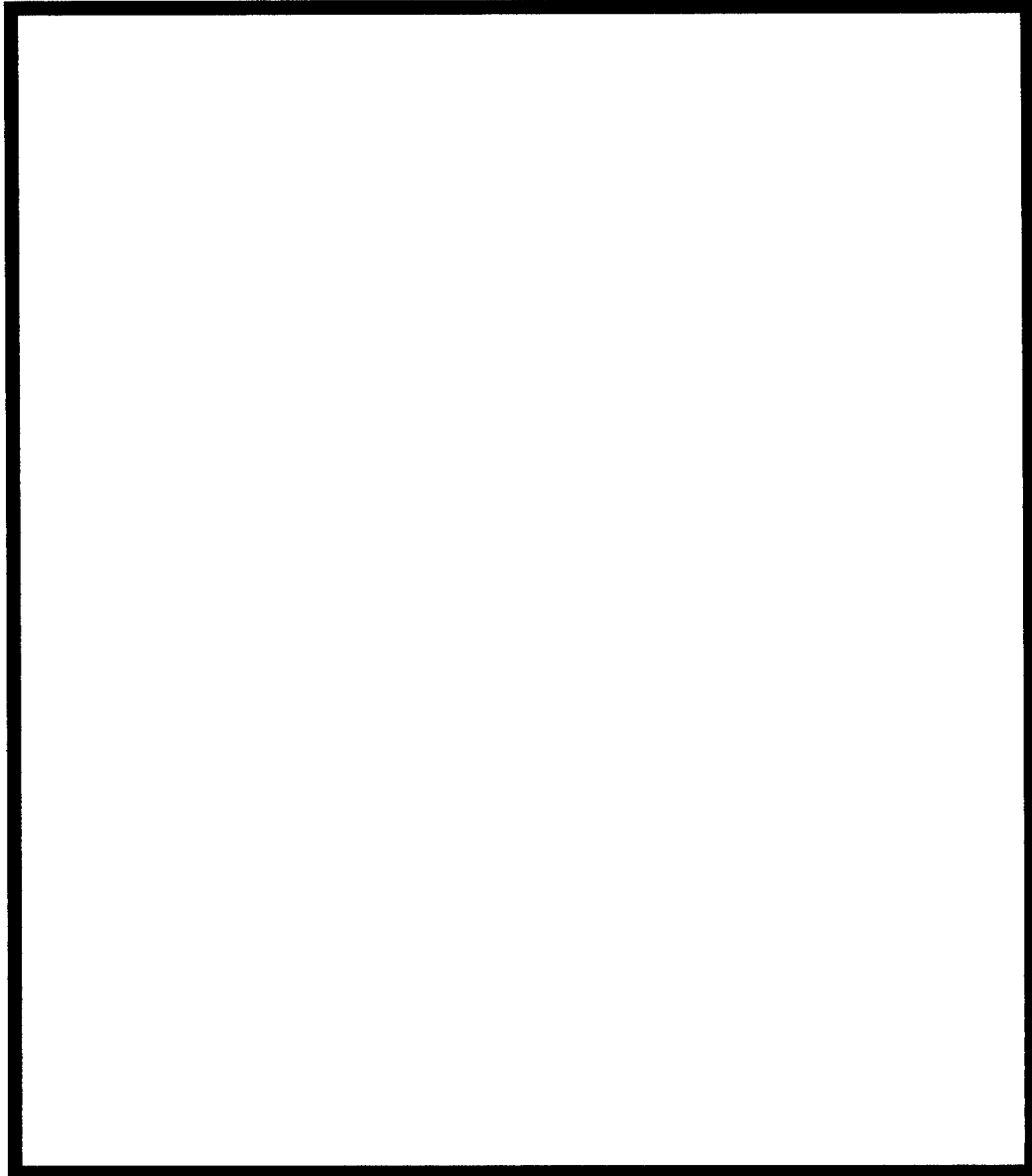
Teachers only please answer question 3.

3. Before joining the faculty of ACSC, I had _____ years of teaching experience.

If you would like a copy of the results of this study, please place your name and an address that will be good in September of 1997 on the attached card.

THANKS AGAIN

Any comments will be greatly appreciated.

A large, empty rectangular box with a thick black border, intended for handwritten or typed comments.

Please return your completed inventory to:

LT COL STEVE BUTLER

APPENDIX B

ACSC RESIDENT CLASS AY97 DEMOGRAPHICS

ACSC Resident Class AY97 Demographics (as of 18 Sep 96)**ENROLLMENT**

| | |
|------------------------|---------|
| USAF | 387 |
| USN | 36 |
| USA | 44 |
| USMC | 10 |
| USAFR | 11 |
| ANG | 14 |
| Civilian | 19 |
| International Officers | 80 |
| TOTAL | 601 |

AERONAUTICAL RATINGS

| COMPONENT | PILOTS | NAVIGATORS | NONRATED |
|-----------|---------|------------|----------|
| USAF | 86 | 42 | 259 |
| USN | 14 | 10 | 12 |
| USA | 0 | 2 | 42 |
| USMC | 4 | 1 | 5 |
| USAFR | 1 | 0 | 10 |
| ANG | 2 | 2 | 10 |
| IO | 55 | 0 | 25 |
| TOTAL | 162 | 57 | 363 |

EDUCATION (US Only)

| DEGREE | USAF | USN | USA | USMC | USAFR | ANG | CIV | TOTAL |
|--------------|------|-----|-----|------|-------|-----|-----|-------|
| Bachelors | 25 | 25 | 18 | 7 | 3 | 13 | 5 | 96 |
| Masters | 348 | 11 | 24 | 3 | 6 | 1 | 12 | 405 |
| Doctorate | 8 | 0 | 2 | 0 | 1 | 0 | 0 | 11 |
| Professional | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 7 |
| Associates | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| High School | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

PME SCHOOLS COMPLETED (Air Force Only)

| | |
|---|-----|
| Squadron Officer School | 376 |
| ACSC (Correspondence or Seminar) | 127 |
| Marine Command & Staff (Correspondence) | 14 |

COMMISSION SOURCE (Air Force Only)

| | |
|--------|-----|
| ROTC | 169 |
| OTS | 119 |
| USAFA | 84 |
| DIRECT | 15 |

AVERAGE YEARS OF SERVICE (Line Air Force Only)

| | |
|----------------------|-------|
| Commissioned Service | 13.62 |
| Total Active Service | 14.70 |

AVERAGE AGE

| | |
|------------------------|-------|
| USAF | 36.66 |
| USN | 35.90 |
| USA | 36.28 |
| USMC | 36.09 |
| USAFR | 38.34 |
| ANG | 36.18 |
| Civilian | 39.30 |
| International Officers | 37.21 |

| | |
|------------------------------|--------------|
| Average Age for Class | 38.43 |
|------------------------------|--------------|

MARITAL STATUS (US Only)

| | |
|------------------------|-----|
| Single | 75 |
| Married | 446 |
| Married--Accompanied | 389 |
| Married--Unaccompanied | 57 |

SEX (US Only)

| | |
|--------|-----|
| Male | 453 |
| Female | 68 |

RACE (US Only)

| | |
|-----------|-----|
| Caucasian | 471 |
| Black | 44 |
| Other | 6 |

APPENDIX C
FINAL EXAMINATIONS

War and Conflict Final Exam

Throughout the War and Conflict Course we presented a number of models and concepts we believe are useful for understanding the problems of war, peace, and conflict. Your task is to analyze the models and concepts listed below. In your analysis, you should: briefly describe, in your own words, all the models or concepts (listed below) based on the information presented in your seminar, lectures, and readings; assess the strengths and weaknesses of each model or concept; and discuss the connection or relationship between three models or concepts (e.g., connect or relate 4, 5, and 7) of your choice. Be sure to support your answer with relevant examples from the course materials, referencing where appropriate; for example (Papp, 172).

1. State Actors and Non-State Actors
2. Core, intermediate, and peripheral motives for war
3. Importance of national political objectives
4. The “z” diagram and congruence
5. Total war versus limited war
6. Importance of the end-state
7. Negotiation

Format:

Use the War and Conflict exam template to format your answer. Refer to WC 601 lesson plan.

War Theory Final Exam**Question 1****(Analyze the ideas of selected war theorists)**

Throughout the War Theory course, you have been exposed to the ideas of various theorists, drawn from many different nations, time periods, and military services. The theorists were selected for their impact on **both military practice in their medium (air, land, or sea) and the development of air and space theory**. In light of this statement, analyze the theories of Alfred Thayer Mahan and Guilio Douhet. Be sure to discuss the relevant elements of each theory, examine points of similarity and divergence, and asses its subsequent impact.

Question 2**(Critical analysis and tools application)**

Conduct a Clausewitzian critical analysis of the development of British armor theory in the interwar years (1918-1939). As part of your critical analysis, discuss the theory's later application with respect to other theories, and explain and defend to what extent it represents a Military-Technical Revolution (MTR) or a Revolution in Military Affairs (RMA).

AY 97 STRATEGIC ENVIRONMENT FINAL EXAMINATION

INSTRUCTION/QUESTION

Consider yourself a staff analyst for the President's National Security Council. You have been tasked to analyze the situation in Bosnia-Herzegovina, project emerging trends, and compare possible US courses of actions consistent with our national security strategy.

Over the past 15 days, you have had the opportunity to gather information and conduct an extensive analysis of Bosnia-Herzegovina using conceptual frameworks introduced during the first phase of this course. Based on this analysis, issues introduced during regional forums, discussions of global trends giving shape to the strategic environment, and US national security strategy, your task for this examination is two-fold.

1) Project a scenario for 1 Nov 1998. Describe a plausible set of conditions that will define the situation in Bosnia-Herzegovina on this date. These conditions should be based on your prior analysis of Bosnia-Herzegovina, the region, global trends, and problems associated with sustained peace.

Assume the US military has withdrawn from the region as planned. Public opinion and downsizing does not support the return of US troops. In addition, NATO IFOR presence has been reduced to a small observer operation due to NATO funding problems and policy gridlock.

2) Using this projected scenario and assuming that the 1 Feb 1996 National Security Strategy of Engagement and Enlargement is still in affect, examine to what extent the United States should get involved. Describe and support the most appropriate method of influencing the region consistent with our national security strategy.

In your response, be sure you draw upon relevant ideas and concepts presented in lectures, seminars, course readings, and previous ACSC courses. ~~Be sure to~~ fully support your answer with persuasive reasoning, evidence, facts, and analysis.

APPENDIX D
INSTITUTIONAL REVIEW BOARD APPROVAL
(Photocopier reduced to meet margin guidelines)

Auburn University

Auburn University, Alabama 36849-5174

Associate Provost and
Vice President for Research
Telephone: (334) 844-4784
FAX: (334) 844-5953

Office of Research Programs
Institutional Review Board
for the Use of Human Subjects in Research
307D Samford Hall
Telephone: (334) 844-5966

February 13, 1997

MEMO TO: Stephen L. Butler
Educational Foundations, Leadership & Technology

Protocol Title: "Habermas' Cognitive Interests: Teacher and Student
Interests and Their Relationships in an Adult Education
Setting"

IRB File: #97-034 EX 9702

The referenced protocol was approved "Exempt" from further review under 45 CFR 46.101 (b)(2) by IRB procedure on February 7, 1997. You should retain this letter in your files, along with a copy of the approved protocol and other pertinent information concerning your study. If you anticipate a change in any of the procedures authorized in protocol #97-034, you must request and receive IRB approval prior to implementation of any revision. In the event of future correspondence or discussion regarding your research, please be sure to reference the above IRB File.

If you have any questions concerning this Board action, please contact Ms. Jeanna B. Sasser at 844-5966.

Sincerely,

Thomas A. Petee /GP

Thomas A. Petee, Chairman
Institutional Review Board for the
Use of Human Subjects in Research

xc: Dr. James S. Kaminsky
Dr. William B. Lauderdale

APPENDIX E
LIST OF POTENTIAL JURORS

Potential Jurors with Expertise in Habermas' Theory

1. Shirley Grundy, Professor of Context Studies, School of Education, Murdoch University, Perth Australia. Dr. Grundy is the author of Curriculum: Product of Praxis, the book widely regarded as the clearest analysis of Habermas' theory as it applies to education.
2. *Frances Kochan, Associate Professor, Educational Foundations, Leadership, and Technology, Auburn University, Alabama. Dr. Kochan teaches a five course sequence of curriculum and instruction courses using Habermas' theory as one of the primary foundations of curriculum theory. She has written several journal articles and presented papers and discussions at the American Educational Research Association and the Mid-South Educational Research Association with Habermas' theory as the primary focus.
3. Jack Mezirow, Professor, Teachers College, Columbia University, New York. Dr. Mezirow is the author of *A Critical Theory of Adult Learning and Education* and *Understanding Transformation Theory*, two articles that stress the importance of Habermas' theory as it applies in adult education.
4. *Evan Robinson, Pharmacy Care Systems, Auburn University, Alabama. Mr. Robinson is the author of Evaluating the Impact of a Pedagogical Institute on Faculty Members' Instructional and Philosophical Orientations, a doctoral dissertation strongly influenced by the work of Habermas and using his cognitive interests as the foundation of his study. He has also presented papers at both the American Educational Research Association and the Mid-South Educational Research Association that had Habermas' theory as the primary focus.

5. *Robert Young, Professor, Faculty of Education, University of Sydney, Australia. Dr. Young is the author of *Critical Teaching and Learning* and A Critical Theory of Education: Habermas and our Children's Future, a journal article and a book both dedicated to applying Habermas' theory into the education of young children.

*Potential jury members who actually participated in this study.

APPENDIX F
REVISED ORDER OF INVENTORY ITEMS

Revised Order of Inventory Items

| Revised Number | Original Number | Cognitive Interest | Revised Number | Original Number | Cognitive Interest |
|---------------------------|----------------------------|-------------------------------|---------------------------|----------------------------|-------------------------------|
| 1 | 43 | T | 24 | 12 | E |
| 2 | 26 | P | 25 | 32 | P |
| 3 | 31 | T | 26 | 34 | T |
| 4 | 1 | T | 27 | 3 | E |
| 5 | 35 | P | 28 | 44 | P |
| 6 | 24 | E | 29 | 14 | P |
| 7 | 13 | T | 30 | 15 | E |
| 8 | 4 | T | 31 | 21 | E |
| 9 | 27 | E | 32 | 28 | T |
| 10 | 9 | E | 33 | 45 | E |
| 11 | 40 | T | 34 | 5 | P |
| 12 | 19 | T | 35 | 23 | P |
| 13 | 2 | P | 36 | 25 | T |
| 14 | 37 | T | 37 | 8 | P |
| 15 | 18 | E | 38 | 36 | E |
| 16 | 30 | E | 39 | 22 | T |
| 17 | 6 | E | 40 | 41 | P |
| 18 | 39 | E | 41 | 11 | P |
| 19 | 7 | T | 42 | 16 | T |
| 20 | 38 | P | 43 | 20 | P |
| 21 | 29 | P | 44 | 10 | T |
| 22 | 17 | P | 45 | 33 | E |
| 23 | 42 | E | | | |

Note. T = Technical, P = Practical, E = Emancipatory.

APPENDIX G
ADVANCE NOTICE FOR STUDENTS

Advance Notice for Students

March 4, 1997

<Rank Last Name>
ACSC/Seminar <Seminar Number>
Maxwell AFB, AL 36112

Dear <Rank Last Name,>

Within the next few days, you will receive a request to complete the Cognitive Interest Inventory. I am forwarding this inventory to you in an effort to learn how the faculty and students of Air Command and Staff College believe people learn.

The inventory is being conducted, in part, to see if it is possible to ensure success for more of our students in the future by matching the cognitive interests of the faculty with those of the students here at Air Command and Staff College. This inventory should take very little time to complete.

This research is being accomplished as part of my doctoral dissertation. I would greatly appreciate your taking the few minutes necessary to complete and return your inventory.

Thank you in advance for your help.

Sincerely,

Stephen L. Butler, Lt Col, USAF
Project Director

APPENDIX H
ADVANCE NOTICE FOR TEACHERS

Advance Notice for Teachers

March 4, 1997

<Rank Last Name>,
ACSC/<DEA, DEB, DEC>
Maxwell AFB, AL 36112

Dear <Rank Last Name>:

Within the next few days, you will receive a request to complete the Cognitive Interest Inventory and The Philosophy of Adult Education Inventory ©. I am forwarding them to you in an effort to learn how the faculty and students of Air Command and Staff College believe people learn.

The Cognitive Interest Inventory is being conducted, in part, to see if it is possible to ensure success for more of our students in the future by matching the cognitive interests of the faculty with those of the students here at Air Command and Staff College. Both inventories should take very little time to complete.

This research is being accomplished as part of my doctoral dissertation. I would greatly appreciate your taking the few minutes necessary to complete and return your inventories.

Thank you in advance for your help.

Sincerely,

Stephen L. Butler, Lt Col, USAF
Project Director

APPENDIX I

ACSC COMMANDANT'S ENDORSEMENT

(Photocopier reduced to meet margin guidelines)



DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY (AETC)



MEMORANDUM FOR ALL ACSC STUDENTS

FROM: ACSC/CC

SUBJECT: Research Survey

1. I fully support the research efforts of Lieutenant Colonel Stephen L. Butler. His research has the potential to benefit ACSC in future decisions concerning curriculum and instruction.
2. Please take a few minutes to complete and return Colonel Butler's Cognitive Interest Inventory. Your inputs are important to this research and may enhance the learning environment for future students of our school.

A handwritten signature in cursive script, reading "Mike Drennan", is positioned above the typed name.

JERRY M. DRENNAN, Colonel, USAF
Commandant

APPENDIX J
DEAN OF EDUCATION AND CURRICULUM'S ENDORSEMENT
(Photocopier reduced to meet margin guidelines)



DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY (AETC)



MEMORANDUM FOR ALL ACSC FACULTY

26 MAR 1997

FROM: ACSC/DE

SUBJECT: Research Survey

1. I fully support the research efforts of Lieutenant Colonel Stephen L. Butler. His research has the potential to benefit ACSC in future decisions concerning curriculum and instruction.

2. This type of research is extremely important to the ACSC community as we continue to improve as an educational institution. It is also important to each of us, individually, as the educators of tomorrow's Air Force leaders.

3. Please take a few minutes to complete and return Colonel Butler's Cognitive Interest Inventory. Your inputs are important to this research and may enhance the learning environment for future teachers and students of our school.

Tommy D. Dickson
TOMMY D. DICKSON, Colonel, USAF
Dean of Education and Curriculum

APPENDIX K

PERMISSION LETTER FROM LORRAINE M. ZINN, Ph.D.

(Photocopier reduced to meet margin guidelines)

Lifelong Learning Options

January 27, 1997

Mr. Steve Butler
248 Andrews Street
Maxwell AFB, AL 36113

Dear Mr. Butler:

This letter will verify that you have my permission to use the Philosophy of Adult Education Inventory[®] (Rev. 1994) in your doctoral study at Auburn University. A clean copy of the Inventory, suitable for reproduction, is enclosed. (I recommend double-sided printing to save on paper and costs.)

Normally, I request a \$2.00 copyright fee for each individual use of the PAEI[®]. However, that fee is waived for graduate students. What I do ask is that you agree to the following conditions:

- ♦ Do not change anything on the Inventory, the Scoring Instructions or Scoring Matrix, or the "Five Philosophies of Adult Education" interpretation sheet. (As a researcher, I'm sure you share my commitment to quoting materials exactly and leaving validated instruments intact.)
- ♦ At minimum, photocopy and send to research subjects pp. 3-11 of the 1994 revision of the PAEI[®] (copy enclosed). I recommend that you also include pp. 1-2 (Cover Sheet and Foreword). If you choose not to include pp. 1-2, you may want to use some of the language from the Foreword (with proper citation) in your own cover letter. A particularly helpful section would be the paragraph that suggests many different terms that may be substituted for the descriptive phrase "Adult Educator." I suggest that you do not include pp. 12-14 in your initial mailing.
- ♦ As an incentive for your research subjects, please offer to send them some interpretive information after they return the completed PAEI[®] (or you may only request their PAEI[®] scores). Remind them to keep a copy of their TOTAL SCORES; then arrange for a way that they can identify themselves for mailing purposes yet still maintain anonymity as research subjects. Copy pp. 12-13 of the enclosed materials to send back to respondents who request the interpretation.
- ♦ Unless you are given alternate guidelines, cite the reference to the PAEI[®] in the following way:
Zinn, L. M. (1994.) *Philosophy of adult education inventory, with foreword* (Rev. ed.).
Boulder, CO: Lifelong Learning Options.
- ♦ Please send me a brief synopsis of your dissertation proposal before you begin the research study; and a copy of your abstract and reference citation for the dissertation when completed.
- ♦ Since I work entirely independently, without benefit of university support, I would appreciate your sending a \$20.00 courtesy fee to cover permission letter(s), camera-ready copy of the Inventory, and miscellaneous correspondence or phone calls.

Please let me know if I can help you in some other way. I wish you the best as you work through your dissertation research.

Sincerely,

Lorraine M. Zinn, Ph.D.

PS: You can also reach me through e-mail: LLOZINN@ECENTRAL.COM

4757 West Moorhead Circle
Boulder, CO 80303-6157

Phone (303) 499-0864
FAX (303) 499-7341

APPENDIX L

PHILOSOPHY OF ADULT EDUCATION INVENTORY

(Photocopier reduced to meet margin guidelines)

PHILOSOPHY OF ADULT EDUCATION INVENTORY®

(Revised, 1994)

The Philosophy of Adult Education Inventory® (PAEI) is an assessment instrument developed to assist the adult educator to identify his/her personal philosophy of education and to compare it with prevailing philosophies in the field of adult education. The PAEI® was designed to be self-administered, self-scored and self-interpreted.

Validity and reliability test data are summarized in *Dissertation Abstracts International*, 44, 1667A-1668A (Zinn, 1983).

Copyright 1994 by Lorraine M. Zinn. All rights reserved. This material is not to be copied or disseminated without permission. Additional copies may be ordered from Lifelong Learning Options, 4757 West Moorhead Circle, Boulder, CO 80303-6157 or FAX 303-499-7341.

FOREWORD

A *philosophy of education* represents a comprehensive and interrelated set of values and beliefs as applied to education--including beliefs about the purpose and nature of human life, the role of the individual in society, purposes or goals of learning and education, role(s) of teachers and students, important subject matter, and effective teaching approaches.

Educational philosophy is primarily concerned with *why* teachers do what they do, whereas various *methods, techniques and/or strategies* describe and guide *what* teachers do. An *educational philosophy* is broader than a preference for specific teaching *methods, techniques or strategies*. Preferred teaching methods, techniques and/or strategies are usually consistent with one's educational philosophy; however, the skilled teacher may selectively use a wide variety of appropriate methods, techniques and/or strategies. *Teaching style* evolves as a combination of one's educational philosophy and preferred teaching methods, techniques and/or strategies. *Educational philosophies* are fairly deeply rooted in people's life values and are unlikely to change significantly. *Teaching methods, techniques and/or strategies*, on the other hand, may change depending on what works best in a particular situation.

A *personal philosophy of education* provides an integrated, consistent basis for making choices in the practice of education, and offers insight into relationships (a) between teacher and learner, (b) between the learner and learning content/activities, and (c) between learning content/activities and the world at large. Identifying one's personal philosophy of education can enhance the degree of congruence between a teacher's beliefs or values and actions in the practice of teaching, and can provide a basis for mutual understanding and acceptance among members of an instructional "team," given the great diversity of teachers, program planners and administrators that comprise the field of (adult) education.

The term *adult educator* may describe anyone who teaches adult learners, whether in formal or informal educational settings; for academic credit or not-for-credit; through individual tutoring, classroom teaching and/or informal discussion groups; helping adult learners to acquire certain knowledge, attitudes and/or skills; for a variety of purposes. *Adult educators* may also be called trainers, tutors, mentors, facilitators, health educators, religious leaders, cooperative extension agents, community service educators, workshop/seminar presenters, etc.

During the past decade, the *Philosophy of Adult Education Inventory*® (PAEI) has been used by hundreds of individuals engaged in teaching or training adults. By all reports, it is considered to be a valuable tool for teacher and trainer in-service, staff development for instructional teams, and education of graduate students seeking advanced degrees in fields such as Adult/Continuing Education and Human Resources. The PAEI® has been selected as the data-gathering instrument for numerous Doctoral dissertations and Masters theses and has been cited in several professional publications. (See list of resources "For Further Information" following the Inventory.) A K-12 version of the instrument, the *Philosophy of Education Inventory*® (PEI), is also available.

— Lorraine M. Zinn, 1994

PHILOSOPHY OF ADULT EDUCATION INVENTORY^o

(Rev. 1994)

INSTRUCTIONS FOR COMPLETION

Each of the fifteen (15) items on the Inventory begins with an incomplete sentence, followed by five different options that might complete the sentence. Underneath each option is a scale from 1 to 7, followed by a small letter in parentheses. For the present, ignore the letters; use only the numbers on the scale.

To complete the Inventory, read each sentence stem and each optional phrase that completes it. On the 1-7 scale, CIRCLE the number that most closely indicates how you feel about each option. The scale goes from 1 (strongly disagree) to 7 (strongly agree), with a neutral point (4) if you don't have any opinion or aren't sure about a particular option.

Continue through all the items, reading the sentence stem and indicating how strongly you agree or disagree with each of the options. Please respond to every option, even if you feel neutral about it. *THERE ARE NO RIGHT OR WRONG ANSWERS!*

As you go through the Inventory, respond according to what you most frequently or most likely do. If it helps you to respond more easily, you may want to focus on a specific course that you teach. If you do focus on a particular course, choose one that you feel most comfortable teaching – one that you think best reflects your preferred style of teaching.

HAVE FUN!

STRONGLY
DISAGREE 1 2 3 4 5 6 7
STRONGLY
AGREE

1. IN PLANNING AN EDUCATIONAL ACTIVITY, I AM MOST
LIKELY TO:

Identify, in conjunction with learners, significant social, cultural, and/or political issues and plan learning activities around them.

1 2 3 4 5 6 7 (h)

Clearly identify the results I want and develop a program, class, workshop, etc. that will achieve those results.

1 2 3 4 5 6 7 (c)

Begin with a lesson plan that organizes what I plan to teach, when and how.

1 2 3 4 5 6 7 (a)

Assess learners' needs and develop valid learning activities based on those needs.

1 2 3 4 5 6 7 (d)

Consider the areas of greatest interest to the learners and plan to deal with them, regardless of what they may be.

1 2 3 4 5 6 7 (f)

| STRONGLY DISAGREE | | 1 | 2 | 3 | NEUTRAL | | 4 | 5 | 6 | 7 | STRONGLY AGREE | | |
|---|---|---|---|---|---------|---|-----|---|---|---|-------------------|-------------------|---|
| 2. PEOPLE LEARN BEST: | | | | | | | | | | | | STRONGLY AGREE | |
| When the new knowledge is presented from a problem-solving approach. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (x) | | | | | | 7 |
| When the learning activity is clearly structured and provides for practice and repetition. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (w) | | | | | | 7 |
| Through discussion with other learners and a group coordinator. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (z) | | | | | | 7 |
| When they are free to explore, without the constraints of a "system." | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (y) | | | | | | 7 |
| From an "expert" who knows what he or she is talking about. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (v) | | | | | | 7 |
| 3. THE PRIMARY PURPOSE OF ADULT EDUCATION IS: | | | | | | | | | | | | STRONGLY AGREE | |
| To facilitate personal development on the part of the learner. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (f) | | | | | | 7 |
| To increase learners' awareness of the need for social change and to enable them to effect such change. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | | | | | | 7 |
| To increase knowledge and develop conceptual or theoretical understanding. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | | | | | | 7 |
| To establish the learners' capacity to solve everyday problems. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | | | | | | 7 |
| To develop the learners' competency and mastery of specific knowledge and skills. | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | | | | | | 7 |

| STRONGLY DISAGREE | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | STRONGLY AGREE | |
|---|---|---|---|---|---|---|-----|---|--|---|--|---|--|-------------------|--|
| 4. MOST OF WHAT PEOPLE KNOW: | | | | | | | | | | | | | | | |
| Is a result of consciously pursuing their goals, solving problems as they go. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (x) | | | | | | | | |
| They have learned through critical or reflective thinking focused on important social, cultural, and/or political issues. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (z) | | | | | | | | |
| They have learned through a trial-and-feedback process. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (w) | | | | | | | | |
| They have gained through self-discovery rather than some "teaching" process. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (y) | | | | | | | | |
| They have acquired through a systematic and comprehensive educational process. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (v) | | | | | | | | |

| STRONGLY DISAGREE | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | STRONGLY AGREE | |
|--|---|---|---|---|---|---|-----|---|--|---|--|---|--|-------------------|--|
| 5. DECISIONS ABOUT WHAT TO INCLUDE IN A LEARNING ACTIVITY: | | | | | | | | | | | | | | | |
| Should be made mostly by the learner in consultation with a facilitator. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (f) | | | | | | | | |
| Should be based on what learners know and what the teacher believes they should know at the end of the activity. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | | | | | | | | |
| Should be based on a consideration of key social, political, economic, and/or cultural situations. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | | | | | | | | |
| Should be based on a consideration of the learners' needs, interests, and problems. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | | | | | | | | |
| Should be based on careful analysis by the teacher of the material to be covered and the concepts to be taught. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | | | | | | | | |

| STRONGLY DISAGREE | NEUTRAL | | | | | STRONGLY AGREE | | | | |
|--|---------|---|---|---|---|-------------------|---|----------------------|--|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY DISAGREE | | |
| 6. GOOD ADULT EDUCATORS START PLANNING INSTRUCTION: | | | | | | | | | | |
| By considering the specific outcomes they are looking for and the most efficient ways of producing them in learners | | | | | | | | | | |
| 1 2 3 4 5 6 7 (w) | | | | | | | | | | |
| By identifying everyday problems that can be solved as a result of the instruction. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (x) | | | | | | | | | | |
| By clarifying the content, concepts, and/or theoretical principles to be taught. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (v) | | | | | | | | | | |
| By clarifying key social, cultural, economic, and/or political issues that affect the lives of the learners. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (z) | | | | | | | | | | |
| By asking learners to identify what they want to learn and how they want to learn it. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (y) | | | | | | | | | | |
| 7. AS AN ADULT EDUCATOR, I AM MOST SUCCESSFUL IN SITUATIONS: | | | | | | | | | | |
| That are unstructured and flexible enough to follow learners' interests. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (f) | | | | | | | | | | |
| That are fairly structured, with clear learning objectives and built-in feedback to the learners. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (c) | | | | | | | | | | |
| Where I can focus on practical skills and knowledge that can be put to use in solving problems. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (d) | | | | | | | | | | |
| Where the scope of the new material is fairly clear and the subject matter is logically organized. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (a) | | | | | | | | | | |
| Where the learners have some awareness of social, cultural, economic and political issues and are willing to explore the impact of such issues on their daily lives. | | | | | | | | | | |
| 1 2 3 4 5 6 7 (h) | | | | | | | | | | |

| STRONGLY DISAGREE | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY AGREE | STRONGLY DISAGREE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY AGREE |
|----------------------|--|---|---|---|---|---|-------------------|----------------------|---|---|---|---|---|---|-----|-------------------|
| 1 | | | | | | | | | | | | | | | | |
| 8. | IN PLANNING AN EDUCATIONAL ACTIVITY, I TRY TO CREATE: | | | | | | | | | | | | | | | |
| | The real world – problems and all – and to develop learners' capacities for dealing with it. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (x) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | |
| | A setting in which learners are encouraged to examine their beliefs and values and to raise critical questions. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (z) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | |
| | A controlled environment that attracts and holds the learners, moving them systematically towards the objectives. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (w) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (f) | |
| | A clear outline of the content and the concepts to be taught. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (v) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | |
| | A supportive climate that facilitates self-discovery and interaction. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (y) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | |
| 9. | THE LEARNERS' FEELINGS DURING THE LEARNING PROCESS: | | | | | | | | | | | | | | | |
| | Must be brought to the surface in order for learners to become truly involved in their learning. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | |
| | Provide energy that can be focused on problems or questions. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | |
| | Will probably have a great deal to do with the way they approach their learning. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (f) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (f) | |
| | Are used by the skillful adult educator to accomplish the learning objectives. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | |
| | Are likely to get in the way of teaching and learning by diverting the learners' attention. | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | |

| STRONGLY DISAGREE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY AGREE |
|---|---|---|---|---|---|---|-----|-------------------|
| STRONGLY DISAGREE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY AGREE |
| 10. THE TEACHING METHODS I PREFER TO USE: | | | | | | | | |
| Focus on problem-solving and present real challenges to the learner. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (x) | |
| Emphasize practice and feedback to the learner. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (w) | |
| Are mostly non-directive, encouraging the learner to take responsibility for his/her own learning. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (y) | |
| Involve learners in discussion and critical examination of controversial issues. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (z) | |
| Are determined primarily by the subject or content to be covered. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (v) | |
| 11. WHEN LEARNERS ARE UNINTERESTED IN A SUBJECT, IT IS PROBABLY BECAUSE: | | | | | | | | |
| They do not realize how serious the consequences of not understanding or not learning the subject may be. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | |
| They do not see any benefit for their daily lives. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | |
| The teacher does not know enough about the subject or is unable to make it interesting to the learner. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | |
| They are not getting adequate practice or feedback during the learning process. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | |
| They are not ready to learn it or it is not a high priority for them personally. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (f) | |

| STRONGLY DISAGREE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY AGREE |
|--|---|---|---|---|---|---|-----|-------------------|
| STRONGLY DISAGREE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | STRONGLY AGREE |
| 12. DIFFERENCES AMONG ADULT LEARNERS: | | | | | | | | |
| Are relatively unimportant as long as the learners gain a common base of understanding through the learning experience. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (v) | |
| Enable them to learn best on their own time and in their own way. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (y) | |
| Are primarily due to differences in their life experiences, and will usually lead them to make different applications of new knowledge and skills to their own situations. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (x) | |
| Arise from their particular cultural and social situations and should not be minimized even as they recognize common needs and problems. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (z) | |
| Will not interfere with their learning if each learner is given adequate opportunity for practice and reinforcement. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (w) | |
| 13. EVALUATION OF LEARNING OUTCOMES: | | | | | | | | |
| Is not of great importance and may not be possible, because the impact of learning may not be evident until much later. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (h) | |
| Should be built into the system, so that learners will continually receive feedback and can adjust their performance accordingly. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (c) | |
| Is best done by the learners themselves, for their own purposes. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (t) | |
| Lets the teacher know how much learners have increased their knowledge and conceptual understanding of new material. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (a) | |
| Is best accomplished when the learner encounters a problem, either in the learning setting or the real world, and successfully resolves it. | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | (d) | |

| STRONGLY DISAGREE | | NEUTRAL | | STRONGLY AGREE | |
|--|---|---------|---|-------------------|---------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 14. MY PRIMARY ROLE AS A TEACHER OF ADULTS IS TO: | | | | | |
| Guide learners through structured learning activities with well-directed feedback. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (w) |
| Systematically lead learners in acquiring new information and understanding underlying theories and concepts. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (v) |
| Help learners identify and solve problems better. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (x) |
| Increase learners' awareness of social, cultural, economic, and/or political issues and help them learn how to have an impact on these situations. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (z) |
| Facilitate, but not to direct, learning activities. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (y) |
| 15. IN THE END, IF LEARNERS HAVE NOT LEARNED WHAT WAS TAUGHT: | | | | | |
| The teacher has not actually "taught." | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (a) |
| They need to repeat the experience, or a portion of it. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (c) |
| They may have learned something else that they consider just as interesting or useful. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (f) |
| They do not realize how learning will enable them to significantly influence society. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (h) |
| It is probably because they are unable to make practical application of new knowledge to problems in their daily lives. | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 7 (d) |

[GO TO THE NEXT PAGE TO FIND OUT
HOW TO SCORE YOUR ANSWERS.]

SCORING INSTRUCTIONS

After completing the Inventory, go back to your responses and find the small letter in parentheses to the far right of each rating scale. This is a code letter for scoring the Inventory. Transfer each of your numbers from the rating scales to the SCORING MATRIX in the right-hand column. For example, for item #1, if you circled a 5 for option (a), write the number 5 in the box for 1(a). Note that item #1 has five different responses: a, c, d, f, h. Record all five of your responses for item #1, then continue with #2 - #15 (which also have five different responses each). When you finish, there will be numbers in every other square in the SCORING MATRIX (like a checkerboard).

YOUR TOTAL SCORES

Now, add all the numbers by columns, from top to bottom, so you have ten separate subtotals. None of these subtotals should be higher than 56; nor should any be lower than 7. For TOTAL SCORES, combine the subtotals from the columns on the Scoring Matrix, as indicated below. Note: TOTAL SCORES should be no higher than 105, nor lower than 15.

$$L(a + v) = \quad B(c + w) = \quad P(d + x) = \quad$$

$$H(f + y) = \quad R(h + z) = \quad$$

[PLEASE GO TO THE NEXT COLUMN
AND COMPLETE THE
SCORING MATRIX.]

Philosophy of Adult Education® SCORING MATRIX

| ITEM | a | v | c | w | d | x | f | y | h | z |
|-------------|-------|-------|-------|-------|-------|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| SUB-TOTALS | | | | | | | | | | |
| ADD | a + v | c + w | d + x | f + y | h + z | | | | | |
| YOUR SCORES | L = | B = | P = | H = | R = | | | | | |

[Scoring Matrix corrected 3/97]

WHAT YOUR SCORES INDICATE

L = LIBERAL (ARTS) ADULT EDUCATION
(Education for Intellectual Development;
General Education for Life)

B = BEHAVIORAL ADULT EDUCATION
(Education for Competence, Behavioral
Change, Compliance with Standards)

P = PROGRESSIVE ADULT EDUCATION
(Education for Practical Problem Solving)

H = HUMANISTIC ADULT EDUCATION
(Education for Individual Self-Actualization)

R = RADICAL ADULT EDUCATION
(Education for Transforming Society)

WHAT IS A PHILOSOPHY OF EDUCATION?

A Philosophy of Education represents a comprehensive and interrelated set of values and beliefs as applied to education – including beliefs about the purpose and nature of human life, the role of the individual in society, purposes or goals of education, role(s) of teachers and students, important subject matter, and effective teaching approaches.

An educational philosophy is much broader than a preference for specific teaching methods – although *preferred* teaching techniques are usually consistent with the educational philosophy. However, teaching techniques most characteristic of one philosophy may be used selectively by a teacher who has a *different* educational philosophy. Educational philosophies are fairly deeply held, closely aligned with people's life values, and unlikely to change significantly. Teaching *techniques* or *teaching style*, however, may vary depending on what works best in a particular situation, as long as the techniques used are not incompatible with basic premises of a teacher's philosophy of education.

On the next page, you will find brief descriptions of these five Philosophies of Adult Education.* You may want to write your score for each Philosophy above the column that describes it. Your *highest* score reflects the Philosophy that is *closest* to your own beliefs; your *lowest* score reflects a Philosophy that is *least* like yours. For example, a score of 90-105 indicates that you very strongly agree with that Philosophy; a score of 25 or lower indicates that you very strongly disagree with a given Philosophy. **NOTE:** If you find your scores fairly equal among all of the Philosophies, or spread among three or more, you may want to spend some time further clarifying your beliefs and values and looking for possible contradictions among them.

Most Adult Educators have a clear primary philosophical orientation, or share two that are stronger than others. Typical combinations are: *LIBERAL (ARTS)* and *BEHAVIORAL*, *PROGRESSIVE* and *HUMANISTIC*, *PROGRESSIVE* and *RADICAL*, or *HUMANISTIC* and *RADICAL*. On the other hand, it is quite unlikely that you would have high scores in both *Liberal (ARTS)* and *RADICAL*, or *BEHAVIORAL* and *HUMANISTIC* Philosophies. These philosophies have key underlying assumptions that are inherently contradictory. (For example, the primary purpose of Behavioral Education is to ensure compliance with expectations or standards set by others; while Humanistic Education is intended to enhance individual self-development — which may or may not meet anyone else's expectations or standards.)

There is no *right* or *wrong* Philosophy of Adult Education. The Philosophy of Adult Education Inventory® is designed to reflect back to you some of your own beliefs, not to make judgments about those beliefs. It is up to you to decide how your beliefs may influence your decisions and actions as an educator, and how your personal educational philosophy may be well-suited, or perhaps not the best match, for the educational setting in which you work.

* Descriptions adapted from J. Elias and S. Merriam (1995), *Philosophical Foundations of Adult Education* (2nd. ed.), Krieger.

| FIVE PHILOSOPHIES OF ADULT EDUCATION | | | | | |
|--------------------------------------|---|--|---|---|--|
| TOTAL SCORES | L = _____ LIBERAL (ARTS) ADULT EDUCATION | B = _____ BEHAVIORAL ADULT EDUCATION | P = _____ PROGRESSIVE ADULT EDUCATION | H = _____ HUMANISTIC ADULT EDUCATION | R = _____ RADICAL ADULT EDUCATION |
| PURPOSE(S) | To develop intellectual powers of the mind; to enhance the broadest sense of learning; to provide a general, "well-rounded" education. | To promote competence, skill development and behavioral change; ensure compliance with standards and societal expectations. | To support responsible participation in society; to give learners practical knowledge and problem-solving skills. | To enhance personal growth and development; to facilitate individual self-actualization. | To bring about, through education, fundamental social, cultural, political, and economic changes in society. |
| LEARNER(S) | *Renaissance person; always a learner, seeks knowledge; expected to gain and conceptual and theoretical understanding. | Learners not involved in setting objectives; master one step before another; practice behaviors/skills to get them right. | Learner needs, interests, and experiences are valued and become part of learning process; learner takes an active role in learning. | Learner is highly motivated and self-directed; assumes responsibility for learning; very involved in planning learning projects. | Learner and "teacher" are equal in learning process; personal autonomy; learner is empowered; voluntary participant.. |
| TEACHER ROLE | The "expert"; transmitter of knowledge; teaches students to think; clearly directs learning process. | Manager, controller; authoritative; sets expectations; predicts and directs learning outcomes. | Organizer; guides learning process; provides real-life learning applications; helps learners work cooperatively. | Facilitator; helper; mutual participant in teaching-learning exchange; supports learning process. | Coordinator; convenor; equal partner with learner; suggests but does not determine directions. |
| CONCEPTS/ KEY WORDS | Liberal arts; learning for its own sake; general and comprehensive education; critical thinking; traditional knowledge; academic excellence. | Standards-based; mastery learning; competence; behavioral objectives; performance; practice, feedback/reinforcement; accountability. | Problem-solving; practical learning; experience-based; needs assessment; transfer of learning; active inquiry; collaboration; social responsibility. | Freedom; autonomy; individuality; teaching-learning exchange; self-directedness; interpersonal communication; openness; authenticity; feelings. | Consciousness-raising; praxis; noncompulsory learning; autonomy; social action; empowerment; social justice; commitment; transformation. |
| METHODS | Lecture; reading and critical analysis; question-and-answer; teacher-led discussion; individual study; standardized testing. | Computer-based instruction, lock-step curriculum, skill training, demo & practice, criterion-referenced testing. | Projects; scientific or experimental method; simulations; group investigation; cooperative learning; portfolios. | Experiential learning; discovery learning; open discussion; individual projects; collaborative learning; independent study; self-assessment. | Critical discussion and reflection; problem-posing; analysis of media output; social action theater. |
| PEOPLE & PRACTICES | Aristotle, Plato, Adler, Rousseau, Piaget, Houle, Great Books Society, Paideia Program, Center for the Study of Liberal Education, Chaulauqua, Elderhostel. | Thorndike, Watson, Skinner, Tyler, Mager, vocational training, management-by-objectives, certification exams, military training, religious indoctrination. | Dewey, Whitehead, Lindeman, community college development studies, citizenship education, cooperative walls, university without walls, community schools. | Rogers, Maslow, Knowles, Tough, group dynamics, self-directed learning, I'm OK, You're OK; diversity education, credit for prior learning. | Holt, Freire, Illich, Kozol, Shor, Ohliger, Perelman, free school movement, Afro-centrism, voter registration/education, social justice education. |

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(Updated 11/96)

APPENDIX M
ROBINSON'S REVISED PAEI
(Photocopier reduced to meet margin guidelines)

| TOTAL SCORES | P / E = _____ Practical / Emancipatory | T = _____ Technical | E / P = _____ Emancipatory / Practical | T / P = _____ Technical / Practical | E = _____ Emancipatory |
|---------------------|---|--|---|--|--|
| PURPOSE(S) | To develop intellectual powers of the mind; to enhance the broadest sense of learning; to provide a general, "well-rounded" education. | To promote competence, skill development and behavioral change; ensure compliance with standards and societal expectations. | To support responsible participation in society; to give learners practical knowledge and problem-solving skills. | To enhance personal growth and development; to facilitate individual self-actualization. | To bring about, through education, fundamental social, cultural, political, and economic changes in society. |
| LEARNER(S) | "Renaissance person"; always a learner; seeks knowledge; expected to gain and conceptual and theoretical understanding. | Learners not involved in setting objectives; master one step before another; practice behaviors/skills to get them right. | Learner needs, interests, and experiences are valued and become part of learning process; learner takes an active role in learning. | Learner is highly motivated and self-directed; assumes responsibility for learning; very involved in planning learning projects. | Learner and "teacher" are equal in learning process; personal autonomy; learner is empowered; voluntary participant. |
| TEACHER ROLE | The "expert"; transmitter of knowledge; teaches students to think; clearly directs learning process. | Manager, controller; authoritative; sets expectations; predicts and directs learning outcomes. | Organizer; guides learning process; provides real-life learning applications; helps learners work cooperatively. | Facilitator; helper; mutual participant in teaching-learning exchange; supports learning process. | Coordinator; convener; equal partner with learner; suggests but does not determine directions. |
| CONCEPTS/ KEY WORDS | Liberal arts; learning for its own sake; general and comprehensive education; critical thinking; traditional knowledge; academic excellence. | Standards-based; mastery learning; competence; behavioral objectives; performance; practice; feedback/reinforcement; accountability. | Problem-solving; practical learning; experience-based; needs assessment; transfer of learning; active inquiry; collaboration; social responsibility. | Freedom; autonomy; individuality; teaching-learning exchange; self-directedness; interpersonal authenticity; feelings. | Consciousness-raising; praxis; noncompulsory learning; autonomy; social action; empowerment; social justice; commitment; transformation. |
| METHODS | Lecture; reading and critical analysis; question-and-answer; teacher-led discussion; individual study; standardized testing. | Computer-based instruction, lock-step curriculum, skill training, demo & practice, criterion-referenced testing. | Projects; scientific or experimental method; simulations; group learning; portfolios. | Experiential learning; discovery learning; open discussion; individual projects; collaborative learning; independent study; self-assessment. | Critical discussion and reflection; problem-posing; analysis of media output; social action theater. |
| PEOPLE & PRACTICES | Aristotle, Plato, Adler, Rousseau, Piaget, Houle, Great Books Society, Paldola Program, Conlar for the Study of Liberal Education, Chautauque, Elderhostel. | Thorndike, Watson, Skinner, Tyler, Mager, vocational training, management-by-objectives, certification exams, military training, religious indoctrination. | Dewey, Whitehead, Lindeman, community college development studios, citizenship education, cooperative extension, university without walls, community schools. | Rogers, Maslow, Knowles, Tough, group dynamics, self-directed learning, I'm OK, You're OK; diversity education, credit for prior learning. | Holt, Freire, Illich, Kozol, Shor, Ohliger, Porelman, free school movement, Afro-centrism, voter registration/education, social justice education. |

APPENDIX N
DRAFT INVENTORY

COGNITIVE INTEREST INVENTORY

FOREWORD

The German philosopher Jürgen Habermas differentiates three generic areas in which human interest generates knowledge. These areas are “knowledge constitutive” because they determine categories relevant to what we interpret as knowledge. They also determine the mode of discovering knowledge and for establishing whether knowledge claims are warranted. The purpose of this inventory is to establish which of these three cognitive interests is the most influential in your experiences as a learner and/or teacher.

INSTRUCTIONS FOR COMPLETION

Each of the forty-five (45) items on the inventory contains a statement about education in general. Underneath each statement is a scale from 1 to 5.

To complete the inventory, read each statement. On the scale, CIRCLE the number that best describes your general beliefs about each statement. The numbers on the scale represent the following: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

Please respond to all items indicating your honest opinion of each statement. If you have no opinion or are not sure about a statement, CIRCLE 3. **THERE ARE NO RIGHT ANSWERS!!!** There aren't even any answers better than others, it is simply what *you* believe.

Students may return completed inventories to your DEC instructor or one of the central collection boxes in DEC or CVV. Teachers may return completed inventories to your respective department heads.

THANKS FOR YOUR TIME.

1 2 3 4 5
STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

1. THE PRIMARY PURPOSE OF EDUCATION IS TO PREPARE THE LEARNER TO CONTROL AND MANAGE THE ENVIRONMENT.

1 2 3 4 5

2. THE PRIMARY PURPOSE OF EDUCATION IS TO PREPARE THE LEARNER TO UNDERSTAND THE ENVIRONMENT SO HE/SHE CAN INTERACT WITH IT.

1 2 3 4 5

3. THE PRIMARY PURPOSE OF EDUCATION IS TO PREPARE THE LEARNER TO BE LIBERATED FROM THE ENVIRONMENT.

1 2 3 4 5

4. THE DESIRED KNOWLEDGE GENERATED BY THE TEACHER-STUDENT RELATIONSHIP IS THE STUDENT OBSERVING THROUGH EXPERIMENTATION, AND REACHING THE CORRECT CONCLUSION.

1 2 3 4 5

5. THE DESIRED KNOWLEDGE GENERATED BY THE TEACHER-STUDENT RELATIONSHIP IS THE STUDENT OBSERVING THE SITUATION AS A WHOLE AND MAKING MEANING FROM IT.

1 2 3 4 5

6. THE DESIRED KNOWLEDGE GENERATED BY THE TEACHER-STUDENT RELATIONSHIP IS THE ABILITY OF THE STUDENT TO THINK CRITICALLY.

1 2 3 4 5

7. THE MOST IMPORTANT LEARNING OUTCOME FOR THE STUDENT IS ACQUIRING IMPROVED SKILLS.

1 2 3 4 5

1 2 3 4 5
 STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

8. THE MOST IMPORTANT LEARNING OUTCOME FOR THE STUDENT IS
 GOOD JUDGMENT.

1 2 3 4 5

9. THE MOST IMPORTANT LEARNING OUTCOME FOR THE STUDENT IS
 ENLIGHTENMENT.

1 2 3 4 5

10. THE REAL VALUE OF ANY THEORY IS THAT IT PROVIDES DIRECTION.

1 2 3 4 5

11. THE REAL VALUE OF ANY THEORY IS THAT IT PROVIDES GUIDANCE.

1 2 3 4 5

12. THE REAL VALUE OF ANY THEORY IS THAT IT REORIENTS POWER.

1 2 3 4 5

13. CURRICULUM SHOULD BE DESIGNED TO CONTROL THE PROCESS OF
 LEARNING BY CONTROLLING THE PROCESS OF TEACHING.

1 2 3 4 5

14. CURRICULUM SHOULD BE DESIGNED SO THE TEACHER AND STUDENTS
 INTERACT SINCE BOTH ARE CONCERNED WITH PROMOTING THE RIGHT
 ACTION.

1 2 3 4 5

1 2 3 4 5
 STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

15. CURRICULUM SHOULD BE DESIGNED TO EMPOWER BOTH TEACHER AND STUDENT. THEIR JOINT DISCOVERIES SHOULD THEN DRIVE FUTURE ACTIONS.

1 2 3 4 5

16. THE ROLE OF THEORY IN EDUCATION IS TO GUIDE OUR ACTIONS.

1 2 3 4 5

17. THE ROLE OF THEORY IN EDUCATION IS TO SERVE AS A RESOURCE FOR OUR ACTIONS.

1 2 3 4 5

18. THE ROLE OF THEORY IN EDUCATION IS TO HELP CONSTRUCT NEW KNOWLEDGE AND PRACTICE.

1 2 3 4 5

19. THE OUTCOME EACH TEACHER SHOULD LOOK FOR IN HIS/HER STUDENTS IS CORRECT BEHAVIOR.

1 2 3 4 5

20. THE OUTCOME EACH TEACHER SHOULD LOOK FOR IN HIS/HER STUDENTS IS MEANINGFUL ACTION.

1 2 3 4 5

21. THE OUTCOME EACH TEACHER SHOULD LOOK FOR IN HIS/HER STUDENTS IS A JUST SOCIETY.

1 2 3 4 5

1 2 3 4 5
STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

22. IN EDUCATION, AUTHORITY RESIDES IN THE PLAN.

1 2 3 4 5

23. IN EDUCATION, AUTHORITY RESIDES IN THE PRACTITIONER.

1 2 3 4 5

24. IN EDUCATION, AUTHORITY RESIDES IN THE HISTORICAL COMMUNITY.

1 2 3 4 5

25. LEARNING INVOLVES *INSTRUMENTAL* ACTION WITH PREDICTIONS ABOUT
OBSERVABLE EVENTS THAT CAN BE PROVEN CORRECT OR INCORRECT.

1 2 3 4 5

26. LEARNING INVOLVES *COMMUNICATIVE* ACTION WHERE EXPECTATIONS
ABOUT BEHAVIOR MUST BE UNDERSTOOD BY AT LEAST TWO PEOPLE.

1 2 3 4 5

27. LEARNING INVOLVES *CRITICAL* ACTION ABOUT THE WAY HISTORY AND
CULTURE HAVE HELPED TO FORM THE LEARNER'S ROLES AND
EXPECTATIONS.

1 2 3 4 5

28. GOOD TEACHERS ARE EFFICIENT IN THEIR ATTAINMENT OF STATED
OBJECTIVES.

1 2 3 4 5

1 2 3 4 5
STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

29. GOOD TEACHERS USE THEIR PROFESSIONAL JUDGMENT TO DEVELOP AN EFFECTIVE LEARNING ENVIRONMENT.

1 2 3 4 5

30. GOOD TEACHERS RECOGNIZE SOCIAL AND CULTURAL ISSUES THAT MAY PLACE CONSTRAINTS ON EACH LEARNER.

1 2 3 4 5

31. MOST SUCCESSFUL EDUCATIONAL SITUATIONS ARE VERY STRUCTURED, WITH CLEAR OBJECTIVES AND FEEDBACK FROM TEACHER TO LEARNER.

1 2 3 4 5

32. MOST SUCCESSFUL EDUCATIONAL SITUATIONS ARE FLEXIBLE ENOUGH TO ALLOW ME TO INTERACT WITH OTHERS WHO HAVE SIMILAR INTERESTS.

1 2 3 4 5

33. MOST SUCCESSFUL EDUCATIONAL SITUATIONS PROVIDE ME WITH VIVID AWARENESS OF SOCIAL AND CULTURAL ISSUES THAT IMPACT ME STUDENT DAILY.

1 2 3 4 5

34. THE MOST IMPORTANT ASPECT OF SOCIAL EXISTENCE IS WORK.

1 2 3 4 5

35. THE MOST IMPORTANT ASPECT OF SOCIAL EXISTENCE IS INTERACTION WITH OTHERS.

1 2 3 4 5

1 2 3 4 5
STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

36. THE MOST IMPORTANT ASPECT OF SOCIAL EXISTENCE IS POWER.

1 2 3 4 5

37. REAL LEARNING OCCURS THROUGH CONTROLLED OBSERVATION AND EXPERIMENTATION OF THE CONTENT STUDIED.

1 2 3 4 5

38. REAL LEARNING ALLOWS FOR THE CONSIDERATION OF ALTERNATIVE INTERPRETATIONS.

1 2 3 4 5

39. REAL LEARNING PROVIDES THE LEARNER WITH AN ACCURATE, IN-DEPTH UNDERSTANDING OF HIS/HER HISTORICAL SITUATION.

1 2 3 4 5

40. THE RESULTS OF EDUCATION INCLUDE INCREASED SKILLS, BEHAVIORS, OR COMPETENCIES.

1 2 3 4 5

41. THE RESULTS OF EDUCATION INCLUDE HELPING LEARNERS INTERPRET, CONSTRUCT MEANING, AND INTERACT WITH OTHERS.

1 2 3 4 5

42. THE RESULTS OF EDUCATION INCLUDE IDENTIFYING REAL PROBLEMS AND CULTURAL MYTHS.

1 2 3 4 5

1 2 3 4 5
STRONGLY DISAGREE DISAGREE NEUTRAL AGREE STRONGLY AGREE

Please CIRCLE the number that best represents your beliefs about each statement.

43. KEY CONCEPTS FOR EFFECTIVE EDUCATION INCLUDE: BEHAVIORAL OBJECTIVES, NEEDS ASSESSMENT, AND COMPETENCY-BASED EDUCATION.

1 2 3 4 5

44. KEY CONCEPTS FOR EFFECTIVE EDUCATION INCLUDE: ROLE PLAYING, RESOLVING CONFLICT, DISCUSSION AND DIALOGUE, AND LEARNING GROUPS.

1 2 3 4 5

45. KEY CONCEPTS FOR EFFECTIVE EDUCATION INCLUDE: ACCESS TO ALTERNATIVE PERSPECTIVES, SOCRATIC DIALOGUE, AND NON-JUDGMENTAL ACCEPTANCE.

1 2 3 4 5

DEMOGRAPHIC INFORMATION

Everyone (students *and* teachers) please answer question 1.

1. My undergraduate degree is in: _____

Students only please answer question 2.

2. Circle the letter of the response that best describes you.

- A. United States Air Force
- B. United States Navy
- C. United States Army
- D. United States Marine Corps
- E. United States Air Force Reserve
- F. Air National Guard
- G. Civilian
- H. International Officer

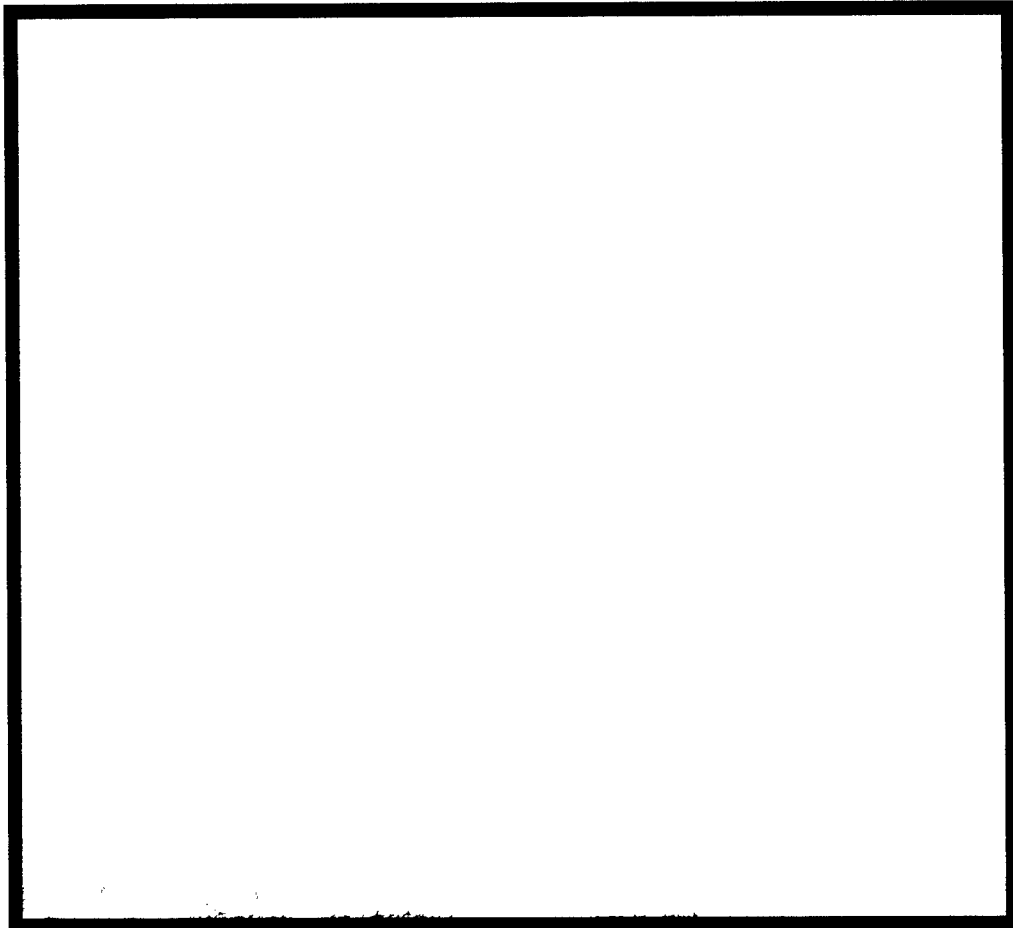
Teachers only please answer question 3.

3. Before joining the faculty of ACSC, I had _____ years of teaching experience.

If you would like a copy of the results of this study, please place your name and an address that will be good in September of 1997 on the attached card.

THANKS AGAIN

Any comments will be greatly appreciated.

A large, empty rectangular box with a thick black border, intended for handwritten or typed comments.

Please return your completed inventory to:

LT COL STEVE BUTLER

Changes Made to Draft Inventory

Based on input from the knowledgeable jurors who assisted in the development of the Cognitive Interest Inventory, items were changed as follows:

1. The following items were completely rewritten: 9, 25, 26, 27, 34, 35, 36, 37, 38, and 39.
2. The following items had minor (less than two words) changes: 1, 3, 6, 7, 8, 11, 12, 14, 15, 17, 19, 21, 24, 32, 33, 40, 41, 42, 43, 44, and 45.
3. The following items remained unchanged: 2, 4, 5, 10, 13, 16, 18, 20, 22, 23, 28, 29, 30, and 31.

APPENDIX O
FACTOR SCORE COEFFICIENT MATRIX

Factor Score Coefficient Matrix

| Item | Cognitive Interest | Factor 1 Emancipatory | Factor 2 Technical | Factor 3 Practical |
|-------------|---------------------------|----------------------------------|-------------------------------|-------------------------------|
| 1 | T | -.033 | .071 | .051 |
| 2 | P | -.059 | .028 | .108 |
| 3 | T | -.072 | .113 | .033 |
| 4 | T | .055 | .106 | -.071 |
| 5 | P | .114 | .037 | -.061 |
| 6 | E | .083 | .017 | -.033 |
| 7 | T | .006 | .128 | -.055 |
| 8 | T | .022 | .110 | -.059 |
| 9 | E | .091 | -.075 | .047 |
| 10 | E | .078 | -.045 | .055 |
| 11 | T | -.115 | .117 | .115 |
| 12 | T | -.014 | .120 | .008 |
| 13 | P | .013 | .018 | .073 |
| 14 | T | .013 | .118 | -.066 |
| 15 | E | .041 | .001 | .043 |
| 16 | E | .051 | -.062 | .085 |
| 17 | E | .068 | -.026 | .058 |
| 18 | E | .122 | -.022 | -.010 |
| 19 | T | -.104 | .145 | .072 |
| 20 | P | -.026 | -.050 | .158 |
| 21 | P | -.115 | -.020 | .234 |
| 22 | P | .069 | -.001 | .027 |
| 23 | E | .174 | .000 | -.082 |

Factor Score Coefficient Matrix (continued)

| Item | Cognitive Interest | Factor 1 Emancipatory | Factor 2 Technical | Factor 3 Practical |
|------|--------------------|--------------------------|-----------------------|-----------------------|
| 24 | E | .168 | -.008 | -.081 |
| 25 | P | -.027 | .035 | .075 |
| 26 | T | .008 | .136 | -.063 |
| 27 | E | .174 | -.008 | -.100 |
| 28 | P | -.024 | .032 | .101 |
| 29 | P | .020 | .031 | .098 |
| 30 | E | .031 | -.074 | .116 |
| 31 | E | .153 | -.008 | -.062 |
| 32 | T | -.103 | .107 | .103 |
| 33 | E | .086 | -.078 | .054 |
| 34 | P | .010 | -.011 | .093 |
| 35 | P | .005 | .058 | .007 |
| 36 | T | -.049 | .121 | .012 |
| 37 | P | -.058 | .018 | .143 |
| 38 | E | .104 | .002 | -.031 |
| 39 | T | .081 | .124 | -.145 |
| 40 | P | -.013 | -.032 | .155 |
| 41 | P | -.040 | -.021 | .132 |
| 42 | T | .039 | .087 | -.038 |
| 43 | P | -.007 | .066 | .062 |
| 44 | T | .008 | .095 | -.011 |
| 45 | E | .139 | -.027 | -.023 |

Note. Cognitive interest in column 2 shows the intended interest of each item

Highest coefficient for each item is in **bold type**

APPENDIX P

SCORING INSTRUCTIONS FOR THE COGNITIVE INTEREST INVENTORY

SCORING INSTRUCTIONS

After the inventory is completed, go back and assign each response a numerical value as follows: SD = 1, D = 2, N = 3, A = 4, and SA = 5. Transfer these numerical scores to the Scoring Matrix on the following page. Each item has only one available space which will place each numerical score into the appropriate column. For example, item 1 represents the technical interest and the Matrix places the score in the technical column. Six of the items (5, 16, 22, 30, 35, and 43) have no space for a response and are not used in final computations.

After completing the Matrix, add the numbers in each column. This will give you three subtotals for each cognitive interest. Add the three technical subtotals, the three practical subtotals, and the three emancipatory subtotals to find the total score for each interest. The technical total should be between 15 and 75, the practical total should be between 11 and 55, and the emancipatory total should be between 13 and 65. Divide the technical total by 15, the practical total by 11, and the emancipatory total by 13. This will give you the mean for each cognitive interest. The highest mean indicates the cognitive interest of each respondent.

Cognitive Interest Inventory

SCORING MATRIX

| IT EM | T-1 | P-1 | E-1 | IT EM | T-2 | P-2 | E-2 | IT EM | T-3 | P-3 | E-3 |
|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1 | | XXX XXX | XXX XXX | 16 | XXX XXX | XXX XXX | XXX XXX | 31 | XXX XXX | XXX XXX | |
| 2 | XXX XXX | | XXX XXX | 17 | XXX XXX | XXX XXX | | 32 | | XXX XXX | XXX XXX |
| 3 | | XXX XXX | XXX XXX | 18 | XXX XXX | XXX XXX | | 33 | XXX XXX | XXX XXX | |
| 4 | | XXX XXX | XXX XXX | 19 | | XXX XXX | XXX XXX | 34 | XXX XXX | | XXX XXX |
| 5 | XXX XXX | XXX XXX | XXX XXX | 20 | XXX XXX | | XXX XXX | 35 | XXX XXX | XXX XXX | XXX XXX |
| 6 | XXX XXX | XXX XXX | | 21 | XXX XXX | | XXX XXX | 36 | | XXX XXX | XXX XXX |
| 7 | | XXX XXX | XXX XXX | 22 | XXX XXX | XXX XXX | XXX XXX | 37 | XXX XXX | | XXX XXX |
| 8 | | XXX XXX | XXX XXX | 23 | XXX XXX | XXX XXX | | 38 | XXX XXX | XXX XXX | |
| 9 | XXX XXX | XXX XXX | | 24 | XXX XXX | XXX XXX | | 39 | | XXX XXX | XXX XXX |
| 10 | XXX XXX | XXX XXX | | 25 | XXX XXX | | XXX XXX | 40 | XXX XXX | | XXX XXX |
| 11 | | XXX XXX | XXX XXX | 26 | | XXX XXX | XXX XXX | 41 | XXX XXX | | XXX XXX |
| 12 | | XXX XXX | XXX XXX | 27 | XXX XXX | XXX XXX | | 42 | | XXX XXX | XXX XXX |
| 13 | XXX XXX | | XXX XXX | 28 | XXX XXX | | XXX XXX | 43 | XXX XXX | XXX XXX | XXX XXX |
| 14 | | XXX XXX | XXX XXX | 29 | XXX XXX | | XXX XXX | 44 | | XXX XXX | XXX XXX |
| 15 | XXX XXX | XXX XXX | | 30 | XXX XXX | XXX XXX | XXX XXX | 45 | XXX XXX | XXX XXX | |
| Sub Total | | | | XXX XXX | | | | XXX XXX | | | |

ADD:

DIVIDE BY:

T-1 + T-2 + T-3 = _____ (Tech Total)

15 = _____ Tech Mean

P-1 + P-2 + P-3 = _____ (Prac Total)

11 = _____ Prac Mean

E-1 + E-2 + E-3 = _____ (Eman Total)

13 = _____ Eman Mean